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Prototype Workshop 2 (PW2) Results Report

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Abstract

This paper describes the results of the Prototype Workshop 2 (PW2). At the Workshop four client search tools were presented for evaluation by NASA Tirekickers. Tirekickers provided comments and suggestions to improve each of the interfaces. These comments have been summarized and presented within the paper. In addition, the complete list of comments and suggestions will be given to the developers of each interface. The User Recommendations Data Base analysts will also review the complete list to determine whether the comments contain were any potential new requirements.

Keywords: PW2, Prototype, Tirekickers, PW1, ESST, IMS, JEST, UMCP,

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1. Introduction

1.1 Purpose

This paper describes the results of the Prototype Workshop 2 (PW2). At the Workshop four client search tools were presented for evaluation by NASA Tirekickers. Tirekickers provided comments and suggestions to improve each of the interfaces. These comments have been summarized and presented within the paper. In addition, the complete list of comments and suggestions will be given to the developers of each interface. The User Recommendations Data Base analysts will also review the complete list to determine whether the comments contain were any potential new requirements.

1.2 Organization

This paper is organized as follows:

Chapter 2 introduces the Prototype Workshop 2 (PW2). Chapter 3 provides a list of the Tirekicker summary comments. Lessons learned from PW1 and how they were applied for PW2 are listed in Chapter 4, followed by the PW2 Process lessons learned in Chapter 5. Chapter 6 summarizes the general recommendations from PW2 Tirekickers. The detailed suggestions and comments for each prototype interface are presented in Chapter 7 starting with the ESST, then the V0 WWW IMS, followed by the JEST tool, the UMCP Dynamic Query prototype, and finally the Coincidence and Subsetting Mockups.

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2. Introduction

Prototype Workshop 2 (PW2) was held January 24-26, 1996. In attendance were NASA Tirekickers, DAAC representatives, ESDIS Project Office personnel and members of the University of Maryland - College Park (UMCP) Human Computer Interface Lab (HCIL). In all there were approximately 40 attendees. Keith Bryant served as the PW2 Lead.

The primary objectives for the Workshop were to:

- Provide visibility into the incremental track development process
- Evaluate emerging technologies as they relate to the incremental track
- Gather constructive feedback on user interfaces and methodology
- Provide input into EP7 development
- Demonstrate advancement from Version 0 and previous Evaluation Packages.

Four user interface prototypes were presented at PW2:

- the Earth Science Search Tool (ESST) - the Release B design and implementation baseline for earth science search, results, browse, and order functionality.
- the V0 WWW IMS - an operational Web interface to Version 0 data containing all of the capabilities of current ESST functionality.
- the Java Earth Science Tool (JEST) - a search tool using some of the ESST and V0 WWW IMS designs in a Web interface featuring the Java programming language.
- the UMCP Dynamic Query Prototype - a search tool prototype designed for exploratory formulation of searches - developed using a different user interface paradigm.

Comments from Prototype Workshop 1, held in May 1995, and EP6, released in December 1995, were taken into consideration by the developers of PW2 prototypes. EP6 evaluators and PW1 attendees had indicated that they wanted prototypes populated with more metadata. In response to this comment, Science Office personnel located ten data collections by searching through the holdings of V0. The metadata from these ten data collections was input to the prototype dataserver where it joined the metadata for three data collections that were chosen for use in EP6. PW2 prototypes were able to search for data from these thirteen data collections. In addition, users wanted to be able to view browse imagery for the designated data collections. PW2 used a link to the V0 gateway that allowed the evaluators to search for data and order browse imagery through V0 (although the stability of the browse link was not consistent).

The structure of PW2 was very similar to that of PW1. Each of the 10 Tirekickers was assigned a workstation. Two Observers were assigned to each Tirekicker, one from a DAAC or ESDIS, the second from ECS. Observers from ECS also acted in the capacity of “coach” - one who was able to prompt/encourage/walk the Tirekicker from task to task. The Workshop was divided into several sessions. Each session was prefaced with a brief presentation covering the prototype content and context for the session. Each Tirekicker was provided with a packet of tasks to

perform using the prototype. Observers were given the same packet with the addition of a list of "things to note" - a set of questions for the Observers to fill out based on the Tirekicker actions and reactions. After each evaluation session the participants reconvened for discussion. On the last day of the Workshop there was a meeting of the Tirekickers, followed by the presentation of a summary of their comments and suggestions to ECS and ESDIS.

3. Tirekicker Comments

The Tirekickers found Prototype Workshop 2 to be a productive experience. Mike Caruso, Tirekicker from WHOI, presented the summary of comments from the Tirekicker meeting held on the last day of the Workshop. The Tirekickers stated, as they had in previous prototype evaluations, that their primary request was to have more data available for end to end tests. It was also mentioned that "the V0 data sets are beginning to get old and may not fully test these prototypes." Tirekickers suggested candidate data sets such as AVHRR data from Dan Baldwin's group and Model data from Fleet Numerical Oceanography Center. Although test data sets may not be supported in EOS, they do provide good testing capabilities.

One of the main areas of discussion during the Workshop was that of Web versus Xmotif-based user interfaces. The Tirekickers "...felt that V0 WWW IMS could be used for 90% of searches that would be conducted." They recommended that the work on the web implementation of the Earth Science Search Tool (ESST) functions and the JEST be continued, but not at the expense of ESST (x/Motif), at least not until Web capabilities catch up with X. The Tirekickers felt certain that "the current web search capabilities will satisfy most novice users and can be used by expert users for general searches. However, expert users will need more functionality than currently offered."

Tirekickers expressed their concern that some of the fundamentals of the system were being ignored during the design of the interface. Examples given during the discussion session prior to the Tirekicker meeting included the issue of designing an interface small enough, flexible enough, and customizable to fit on both small and large screens. Font sizes, balloon help, and scroll and slider bars were mentioned as design ideas to take into consideration. The Tirekickers commented, "...if you believe that form follows function, then the interface design should be a result of the search fundamentals. You can spend endless time deciding if a button should be red or green, or on the left or right." In other words, if the developers design the screens to fit the order in which users will want to use them the details of the design, such as where individual buttons go within each screen, will fall in to place more naturally than in the current design.

As they did in PW1, Tirekickers requested that they be given more time to test prototypes between Workshops. They also "...felt that Hughes could be more proactive in soliciting opinions from the Tirekickers." Tirekickers encouraged developers to contact them for clarification of design issues, scenario development, etc.

There was a significant amount of discussion throughout the Workshop on the issue of the ability of the system to handle metadata exceptions. "A user should be able to locate data even if a search parameter does not have a field in the metadata." The example given to illustrate this issue, "...if you are searching for daytime AVHRR, and some holdings do not have day/night set, there should be a mechanism for reporting this. Perhaps a score parameter, or a list of the number of granules each search parameter returned."

Another important capability the Tirekickers said was missing from the prototypes seen up to this point was the ability for a user to specify Boolean searches. "For example, I might want to search for AVHRR data that did NOT come from NOAA-9 AND had a cloud mask."

Tirekickers agreed that one of the major improvements in the ESST is the ability to configure different interfaces for different users/searches. "Most user interface complaints could be resolved with a highly configurable interface."

4. Impact of Lessons Learned from PW1 on the Format of PW2

The most significant comment made by PW1 attendees was that ECS should hold more prototype workshops. PW2 attendees agreed and have already begun asking about PW3.

Attendees at PW1 requested more "hands on" time on the system. In response, during PW2 there were designated "free time" sessions each afternoon for those who wished to explore the prototypes on their own. ECS personnel were present to answer any user questions.

No demonstrations were given during PW2 because the participants of PW1 had commented that this was not necessary, and not reflective of a real-world situation.

The tasks that PW2 Tirekickers were asked to perform were designed with minimal structure to allow for increased exploration within the prototype. This was in response to the PW1 comment that the tasks were too structured. As in PW1, PW2 Observers were provided with a list of "things to note" as the Tirekicker performed each task.

The PW2 schedule was specifically designed to allow time for a Tirekicker meeting on the last day of the Workshop so that they could discuss things about the Workshop and develop consensus on which issues, comments, and suggestions to present to ECS and ESDIS. The meeting was included in the PW2 schedule because an impromptu Tirekicker meeting at the end of PW1 had been very productive and provided valuable information to ECS on the Tirekicker viewpoints on prototype design and Workshop format.

In order to keep Tirekickers and other PW2 attendees informed of the progress in design and construction of the prototypes and the format and content of the Workshop, a PW2 home page was established and updated as new information was available. This was in response to a PW1 request to keep Tirekickers more "in the loop" between EPs and PWs.

One of the comments that was not accommodated for by PW2 was the request by PW1 attendees that they be allowed access to the prototypes prior to attending the Workshop. The rationale for not granting this request was that providing access to the prototypes prior to the Workshop would not allow Workshop Observers to note the Tirekickers' reactions to the interfaces.

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5. PW2 Process Lessons Learned

The PW2 development team noted the following things that could improve the Prototype Workshop process:

1) **ECS should encourage all participants to be Tirekickers, and should provide Observers from ECS.** Participants worked better in pairs. In many cases the Tirekicker and the DAAC/ESDIS Observer teamed up to evaluate the prototypes. In some cases, participants who worked as a team generated more comments and suggestions than those who didn't.

2) ECS should ensure that a similar, if not roomier environment is established for the next Workshop. Providing one room for all hands-on portion of the Workshop was very effective, compared to the physically distributed environment used in PW1. Problems encountered during the hands-on sessions were quickly discovered and resolved with little delay. Although the room was crowded, it was a productive environment.

3) ECS should continue to provide the tasks and survey on-line and not give paper-copy task packets to Tirekickers. On-line tasks and survey access using the Netscape v 2.0 Frames feature was effective. Users found it easy to answer the survey on-line. Participants were given the tasks on paper; this reduced the effectiveness of having the tasks provided on-line. On a related note, ECS should include survey questions that relate to other aspects of prototypes development (i.e., paradigm, flow) than "look and feel."

4) It was well-worth allowing for periods of free time within the PW2 schedule. Participants took advantage of the free time to further explore PW2 prototypes.

5) ECS should allow users to log in to Workshop prototypes from remote sites after the conclusion of the Workshop so they can continue to explore and comment on the prototypes. Participants requested access to the system before the Workshop and requested that they be allowed to "take something home" to evaluate over a period of time at their own site.

6) ECS should test the environment more rigorously prior to the Workshop. There were some technical problems involving the computing environment.

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6. PW2 General Recommendations

The overall recommendations that were discussed at Prototype Workshop 2 were:

1) Tirekickers envision that the majority of users would access ECS through the Web and then get the X/Motif client to do the more detailed searches. A simplistic Web page will satisfy a large number of users and the full capabilities should be in motif, the interface capabilities don't have to be the same.

2) Tirekickers want a system that can handle searches of empty metadata fields. If the metadata for a data collection is not complete leaving a metadata field empty, the system needs to be able to inform the user that the attribute queried on may not be in the metadata for all data collections.

3) Need more data, of different types to really do an end-to-end evaluation of the system. Recommended data sets include: simulated data sets, model data, high resolution data, and swath data.

4) Stop/Cancel buttons for searches. Provide the ability to stop one or multiple searches.

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7. PW2 Specific Recommendations

The following sections provide comments and recommendations for each of the areas covered by the Workshop. Emboldened text is used to emphasize the area of interest or importance recommended by the Tirekickers for re-design.

7.1 Earth Science Search Tool (ESST)

The Earth Science Search Tool is the prototype for the Release B client interface. It is built using X/Motif and C++. It was first demonstrated at Prototype Workshop 1 (PW1). After improvements were made based on comments made by Tirekickers, it was incorporated into Evaluation Package 6 (EP6). Most PW2 participants who were familiar with the PW1 and the EP6 versions of the ESST were pleased with the improvements that have been made to the prototype.

Search Summary Screen (Main screen):

Participants were pleased with the general layout of the ESST but noted that it may not be using the screen real estate most efficiently. A number of participants voiced concern that the **window size of the ESST was too large** for users with small monitor sizes. Although it was designed with small monitor sizes in mind, it would be difficult, if not impossible for users with small monitors to display more than one ESST window on their monitor simultaneously. Tirekickers suggested that the developers put more effort into designing windows for those with small monitors.

The main screen of the ESST contains the attribute summary window, a temporal summary window, and a spatial summary window. Users liked the search criteria displayed on one screen but were disappointed with some aspects of the **attribute toolbar**. Evaluators noted that **font size was too small** to read comfortably. In some cases, the font didn't fit within the bounds of the icon. During the discussion session following the evaluation of the ESST, developers mentioned that a **"balloon help"** type option could be implemented that would display the full name of each icon as the cursor is moved over it. Comments made by Tirekickers indicated that they thought it was a good idea.

Tirekickers liked the ability to customize the attribute tool bar using the **Attribute Selection Tool**. Although they found the tool useful, they did not necessarily find it easy to use. It was suggested that "visual cues" be given to the user so they know how to work the "Add, " "Delete," and "Apply" buttons. Users should also be able to customize the order in which they would like the attributes to appear in the toolbar. Some Tirekickers wanted the new attributes to always appear at the end of the bar, others wanted to insert the attributes in the toolbar in a prioritized order. In some cases it was not obvious as to the contents/definition of an attribute. Users should have some way of getting the definition of an attribute so they know whether or not to select the icon.

Participants had a number of comments about the **Map Tool**, foremost of which was the fact that there was no capability for the user to type in the desired geographic coordinates. The lack of a number of map projections from which to select was disappointing to many. As was said about the map tool in EP6 and in EOSView, participants had comments about the **zoom capabilities,** specifically that the user could not define the desired zoom area. Using the tool as it is currently implemented, the further in to an image a user zooms, the harder it is to find the area of interest. The map tool should allow a user to select the area in which he or she would like the zoom area centered. Evaluators seemed glad to hear that the Map Tool is being redesigned for EP7.

The **Temporal Selection Tool,** also known as the "Timeline Tool" was liked although it seemed to suffer from technological difficulties. It was difficult for Tirekickers to select multiple time ranges because the timeline had a color refreshing problem which made the timeline look a bit confusing. As with the map tool, users would like the capability to type in their temporal search criteria.

The ESST should provide a "Stop Search" or **"Cancel Search" button** for users so they can abort a search. Furthermore, the user should have a means to stop one search or multiple searches.

Search Results Screen:

Tirekickers wanted more control over the display and **organization of the Results Screen**. They wanted the screen to be user customizable and very flexible. While they recognized that there is a large amount of information to display on the Results Screen, they questioned whether the current display was the most efficient or clearest way to display the information.

It was not obvious to first-time users that the small icon next to the collection name was a folder and could be "opened" to reveal the granule level information for that data collection. Users said that after they had seen someone else click on the folder to reveal the information, they knew how to do it for themselves.

The most significant comments about the Results Screen came from the discussion session. Tirekickers indicated that they wanted the ability to **graphically display the metadata** for each granule, specifically the location of each granule on a map and timeline. Users said that because they will define geographic regions using a map when constructing a search query, they should be able to review the coverage of the returned granules using a map. This capability would make the selection of data much easier.

7.2 Version 0 WWW IMS

The Version 0 WWW IMS is an operational interface to the Version 0 data system. This Web interface was built to complement the V0 Graphical User Interface and Character User Interface, and to provide Web access to the Version 0 data collections. The version evaluated at PW2 was the first operational version of the Web interface.

Comments made about the Web interface during the discussion session indicate that Tirekickers liked having the ability to search for earth science data using a Web interface. They also had a number of suggestions for developers to improve the interface. Because this prototype was the

most mature of those evaluated at PW2 it generated the greatest number of comments and observation notes.

Search Screen:

Tirekickers thought that the **screen real estate** could be more efficiently managed. There are a number of search attributes on the Search Screen which Tirekickers thought should be more efficiently displayed. They suggested having some type of Index of attributes at the top of the page. Compression of attribute icons was also suggested. Some Tirekickers did not realize that the attribute icons were "clickable" because there is no highlight color around the icon. It was also mentioned that items required for input should be listed first in the Search Screen.

The **Parameters list** was a focus of attention during the evaluation. Many users found the long list of parameters to be cumbersome and difficult to navigate. It was suggested that users should be allowed to type in the parameters in which they were interested and the system would insert that parameter or return all of the associated **aliases** for that parameter. Another alternative would be to allow the user to type in the beginning of the word such as in the software called "cc:Mail." The user would be able to type "cl" and all the parameters beginning with "cl" would appear, for example, "cloud," "cloud cover," "cloud top height," and "cloud top temperature." Many users wanted some kind of **"Find" capability** so that they could search the parameter list for a particular parameter or text string. It was also suggested that an **alphabetical index** be provided at the top of the parameter list.

In some cases, users were able to find and select the parameters they were interested in, but had trouble finding the **"OK" button**. Some Tirekickers did not recognize that the multiple "OK" buttons were active buttons, instead they thought they were some type of header or separator. It was recommended that the "OK" buttons be made more conspicuous. Some Tirekickers didn't realize that the "OK" button would take the user back to the Search Screen. They were expecting it to accept the selected parameters and then display the next section of the Parameter list.

The **Map tool** also received a few comments. Tirekickers were disappointed that there was no zoom feature. Some found it hard to edit the map selection. Users liked that when they selected a geographic area using the map tool, the latitude/longitude type in fields were updated. It was suggested that this feature work in reverse too: as the user types in the maximum and minimum latitude/longitude information, the tool should display the selected area on the map.

Tirekickers requested that the format used for entering a **date/time period** be more flexible. One Tirekicker commented that he had entered a date using the wrong format but the error message he received from the system was not clear about how to correct the problem. He felt that the format should be flexible enough to accept "1994" or "94."

Towards the bottom of the Search Screen there were some **items which caused confusion** for users. It was not clear that "return granules with browse only" would limit the search results. In reality there could be a lot of data but none with an associated browse image; if the user checked the "browse only" option they would never get these "hits." Many Tirekickers could not find the "Start Search" button readily, they described the button as "inconspicuous," and "obscure.". It was suggested that the "Start Search" button be colored green or highlighted in some way for emphasis.

Communication Status Screen:

Tirekickers liked getting the "Search In Progress..." screen/feedback indicator, although they found the blinking "in progress" to be redundant. They also liked the concept of the **"Communication Status"** screen, however, they found it confusing. The meaning of red circle with a line slashed through it as an indicator of status was not understood by the V0 WWW IMS users. Similarly, they found the row of four status boxes next to each DAAC site listing to be confusing. Tirekickers insisted that a key/legend should be provided to help users interpret the displayed status summary.

A significant portion of the discussion session dealt with the issue of seeing the results as soon as they are returned, rather than having to wait until all the results are returned. V0 developers explained that this is a limitation of the web technology and there is little, if anything the developers can do. The discussion then led to what would happen if the user used the **"Stop" button** to stop the search. It is not clear what the user would be able to view - whether the user would get any results back or if he would get only the results that had been returned at the moment of stopping the search. Some users found the wording of the instructions to be contradictory - Stop: Do nothing; or continue to the Search Results screen. The limitations and role of the "Stop" button should be clearly explained and available to the users.

Search Results Screen:

Users were asked to **sort results** by start date and most were able to select the "sort by Start Date" but few completed the second part of the task which resorted the results list. Tirekickers also suggested a sort by "ascending or descending date/time/size" options.

Tirekickers requested that the results list return the **parameters that caused the "hit"** for each granule. It was not clear why some granules were returned based on the search criteria the user submitted. One Tirekicker suggested providing a weighting on the parameter so that the system returns a "score" with each hit.

One of the evaluation tasks asked the users to **examine a data set listing** and determine the data set attributes and other information about the data set. Users did not always get what they expected when they selected icons for more information. To find out which granules came with a particular data set users clicked on the highlighted word "granules" which led them to a definition of granule. They did not know to click on the un-highlighted icon to the left of the highlighted word. Tirekickers commented that this portion of the interface was confusing. Many links led them to unexpected information, not enough information, or to non-working links.

Another task asked the users to **select a granule** and determine its attributes, and other information available, and to download a browse image for that granule. The most significant problem seemed to be that if a user selected a granule, read the information about it, and then returned to the results list, the granule that he previously selected was not highlighted. It was not possible for a user to see which granules he had already investigated, and which he had not. The information on those granules with multiple browse images did not clearly state how to select more than one at a time. Users found it difficult to navigate through this portion of V0 and

suggested that a bar of icon options be displayed on the top of all pages so users don't get lost in the system.

After selecting a set of granules to order, users were told to put them in their "shopping cart." The **shopping cart paradigm** was liked by nearly all participants, but they found some portions of the implementation difficult to understand. In many cases Tirekickers found switching between the order screen and the packaging information screen to be non-intuitive. After attempting to place granules in their shopping cart, some users were not sure if they had successfully completed the operation. An Observer noted that the Tirekicker didn't understand that after the packages were selected that he had to press "Order," then fill in the contact information, then order the data. It wasn't clear which step would end the order process until the user actually got to the end and received the order summary information. Perhaps some type of "road map" or progress chart should be provided to help users navigate through the steps of data search, retrieve, review, and order.

The **"Choose Package"** implementation confused a number of Tirekickers. Some users were confused about granule versus package versus package of multiple granules. Others wondered why they had to select a granule to choose a package, it isn't obvious that you have to select a package until you see all of the choices. A user commented that they wanted to be able to choose a package and get a list of all granules at once, rather than going back and forth between screens. Many Tirekickers commented on the Choose Package table, they found it to be confusing. It was recommended that information on media format be provided from the table because some science community users may not know all the details of media types. Another suggestion was that some users may not know what "packaging" is, and that it should be re-labeled as "Physical Media Selection" or "Shipping Method."

Order Form:

Many Tirekickers commented that they were confused why default was set to **empty the shopping cart** once the order has been submitted. Some users didn't notice the default but were surprised when they submitted the order that the shopping cart had been emptied. Tirekickers had some problems entering the contact information into the order form. In some cases they entered information but skipped a mandatory field. When they returned to the previous page to enter the information all of their contact information had been deleted. There was no way to return to the order form without hitting the browser "reload" button. Each page should have a "back" button so that a user can see the contents of the previous screen. In another instance a user typed in his middle initial, then erased it. When he submitted his order, and the middle initial appeared in his contact information, he was displeased. It was also suggested that the user be able to confirm the address information before submitting requests. Because users had a number of problems entering the contact information, some suggested that there should be a capability to save contact information between sessions.

7.3 Java Earth Search Tool (JEST)

The Java Earth Search Tool is a Web with Java based Earth Science Search Tool. One of the driving forces behind the development of JEST was to demonstrate the ESST capabilities in a World Wide Web environment. JEST was developed with the knowledge that Java technology is

in its infancy and that the Web environment does not support many of the ECS requirements that the X/Motif ESST is required to meet.

Although the general consensus of the Workshop participants was that ECS should continue developing a Java-based interface, they agreed that development was not to continue at the expense of the X/Motif tools. Tirekickers had a number of comments and suggestions to improve the JEST.

Attribute Selection:

The first step in using the JEST was to **select a set of attributes** from which the user could construct a search. The paradigm employed in JEST was that users could select a set of attributes that they could name and save for use across sessions. This was analogous to the Attribute Selection Tool employed in the ESST. However, many Tirekickers didn't seem to grasp the meaning of the attribute selection step. The idea of defining an attribute set "from scratch" didn't seemed awkward to the Tirekickers, rather, the users expected to be given a default set that they could then customize.

Selection of attributes for the set may have been easier if **definitions for each attribute** were provided so the users could determine if it was an appropriate attribute for their attribute set. In some cases the attribute icon title was not appropriate for the attribute information available using that icon. Once a set of attributes was selected users should have clicked on the button at the bottom of the screen "Create New Search." However, this wording confused many Tirekickers because they weren't sure if it would save the attributes they had just selected, or clear the selected attributes so the users could start their selection over.

Editing an Attribute Set:

Tirekickers found it difficult to call up a previously saved attribute set, make modifications to it, then give it a new name, because the software saved the modifications to the old attribute set name. It was not intuitive as to how to edit a previously saved attribute set and save the modified set under a new name. This task highlighted the difficulty that the Tirekickers had in using an interface which employed an unfamiliar terminology in the context of data search and retrieval. In some cases the word "Search" was used where "Construct Search" might have been more appropriate, and "Search Attributes" rather than the more familiar, "Search Criteria." ECS should ensure that the interface terminology is consistent across applications within ECS and familiar to those who have used similar systems.

Map Tool:

The Spatial attribute contains a map tool that is really a Java "applet," software that the user can download from the server to his own machine. Once it has been loaded on to the computer it can be used to select spatial search criteria. Tirekickers found this tool very difficult to use. Panning and Zooming controls were difficult to interpret and the function of the arrows on the display were unclear. Users experimented with the map controls to try and learn how they function but most did not appear to work. Tirekickers liked the way the cursor coordinate location was updated as the cursor was moved across the map. After users had selected a region on the map they found it difficult to save their selection and return to the other attributes. This problem is due to the way Netscape and the Java applet programs interact, the user must select the area of

interest and then quit the applet program by clicking on a second button, in this case "Continue" to return to the attribute list.

Timeline Tool:

Users had a very positive reaction to the Timeline on the whole. Users liked having the ability to type in their time range of interest and being able to select the range using a click and drag feature. It was suggested that users be able to **highlight data collections** in the timeline window to select the whole collection, for example, by double clicking on them. Tirekickers liked the data collection summary information that was displayed when the user moved the cursor over a data collection in the timeline. The main problem with this implementation was that the summary information sometimes had to be scrolled and as soon as the cursor moved off of the data collection timeline, the summary information disappeared.

Other suggestions for the Timeline tool included displaying the dates at the top of the timeline window and making sure that date ranges typed in by the user are graphically displayed in the timeline window.

Results:

Although the JEST results screen was a mockup Tirekickers were able to comment on the screen layout and functionality. Tirekickers commented that they wanted to be able to look at granule information across datasets. The JEST results screen did not allow that; the user had to view each data collection one at a time. It was not clear to the Tirekickers how results could be saved, because there was no way to recall previous search results other than by resubmitting the search.

Because the JEST was the least mature of the prototypes evaluated at the Workshop it had a significant number of comments regarding consistency between screens, button naming, font sizes, etc. The JEST detailed comments, as well as similar comments about the other prototypes have been passed along to their respective developers.

7.4 UMCP Dynamic Query Prototype

The University of Maryland College Park (UMCP) Dynamic Query Prototype has an interface that allows the user to explore the data holdings before submitting the search for the data. As users select search criteria from the map tool, parameter lists, or time range, the number of data "hits" is dynamically updated. Through this dynamic updating the interface can provide an estimate of data "hits" to the user prior to submitting the search. The interface also displays the relationships of metadata to data across the data holdings. This interface was demonstrated as an example of a potential novice user interface.

Query Preview Screen:

During the discussion session held after the evaluation session, Tirekickers mentioned that they liked the initial "Query Preview" screen. They thought this was a **good and intuitive interface** to allow users to select data, see relationships among data, and explore available resources. It needs some refinement and the ability for users to customize it, but on the whole, it was considered a good interface.

It was not immediately clear to users how to **de-select attributes** they had previously selected. Once users were shown how to de-select they seemed to like the implementation. It was recommended that a "de-select all" or "clear all" button be provided. Through experimentation with the selection parameters it was not clear to users whether or not the interface was using a Boolean AND or OR between the search criteria. This should be made clear to users.

Users liked being able to select data using **the map** or by geographic region. However, they didn't like the way the map regions were pre-defined and questioned why there were 18 regions and not 20, 200, or 10,000. One advantage of the pre-defined regions was that a user would be able to select data by "polar region," which is not currently available within ECS prototypes.

The interface was designed such that it would not allow a user to submit a search with a **"hit" estimate** of 500 or more. If the user created such a search, the interface would not allow the user to submit it. The 500 data granule limit was an arbitrary number chosen to reduce the number of hits on the data server. Tirekickers did not like this limitation and suggested it be removed.

Query Refinement Screen:

Tirekickers liked the "**Starfield**" concept - the ability to display data collection information in two dimensional space. The UMCP Dynamic Query tool displayed the data collections based on time-range and data collection size colored by processing level. It was suggested that the Starfield be customizable so that users could display information they are interested in. Some users, for example, may not be concerned with processing level.

Users liked the linkages between the data displayed in the Starfield, the map, and the attribute information available on this screen. However, some found the linkages difficult to evaluate because the metadata populated within the tool was not real metadata. In some cases they found the fake data collections confusing. In other instances, the linkages between the attributes, map tool, and Starfield weren't consistent or programmed.

There was some confusion and dissatisfaction with the implementation of the "**details on demand**" feature. It was not clear to the users that the data collection displayed in the Starfield had to be highlighted before the "details on demand" button could be activated. It is important that the relationships among each of the tables and action buttons be clearly displayed to the user.

The interface design prompted discussion about the ability of users to search ECS for data collections with incomplete or **missing metadata**. Tirekickers also questioned how this interface could be adapted to allow users to search on "events" or "conditions." It was suggested that this kind of interface would be able to display the metadata information the data collection contained. The discussion then focused on the importance of incorporating real data, real metadata, and new types of data into ECS prototypes.

On the whole there was a positive reaction to the interface. The PW2 participants felt that this interface led the user in an intuitive way to search for data from general research criteria to specific examples of the data needed. There were some **concerns about the salability** of this interface and the computing power required by client software to implement these design concepts on a larger scale, with more diverse data.

7.5 Subsetting and Coincidence Search Mockups

On-line screen mockups of the Subsetting Service and the Coincidence Search Service were presented at Prototype Workshop 2. Using a WWW browser Tirekickers could walk through each mockup following a scenario. The mockups were static in the sense that users could not select items that were not within the bounds of the scenario.

Subsetting:

During the discussion of the Subsetting service it was suggested that ECS wait to read the upcoming **Subsetting Working Group report** before redesigning the Subsetting service. The report should contain details on how the Working Group expects data to be subsetted and the capabilities that will be needed. Tirekickers requested the ability to subset data by temporal parameters. Developers will develop an interface that will support the subsetting services promised in Appendix F of the DID 304.

There were a few comments about the interface design. One Tirekicker liked the way data which had been marked for subsetting were labeled with an "s" in the Service column on the ESST. It was also suggested that the subsetting summary display different colors for different collections. A "subset all" button was recommended, so that users would be able to subset all data within the bounds of one subset window.

Coincidence Search:

The Coincidence Search service raised a number of questions. It was unclear as to where access to Coincidence Search should be allowed within the interface. The presented implementation forces the user to first search for data to create a "target" data collection. From this point the user can select Coincidence Search, they move to a second screen and build a search for coincidence of other data with the "target" data collection. Tirekickers questioned whether this second step was necessary,. It was suggested that the Coincidence Search be available as a Search attribute from the main ESST screen.

Tirekickers requested that they be able to see where granules themselves are coincident; some type of map tool or temporal window should be available to **display the granule coincidence**. This capability would be important to allow users to view the spatial and temporal bounds of the data prior to ordering it.

Users also requested the ability to see coincidence between point data and swath data, and coincidence between swaths. Discussion about the service brought up the issue of the ability to search for coincidence and an associated "**tolerance**." Users should be able to enter a coincidence search for data collected within "+/- 1.5 kilometers" or "+/- 6 hours" of the target data collection. It was not known at the time whether such a "tolerance" feature could be implemented. There was some fear among Tirekickers that users may be misled by the precision of the coincidence search. They recommended it be billed as a "Potential for Coincidence."

7.6 Conclusion

Although the major suggestions and comments from the PW2 participants have been summarized within this paper, the complete list of comments and suggestions (Appendix A and B) will be passed on to the developers of each of the interfaces. Furthermore, all of the comments will be reviewed by the User Recommendations Data Base (URDB) analysts to determine which are potential new requirements subject to formal review by ECS. Those entered into the URDB will be available on the URDB web site (http://epserver.gsfc.nasa.gov/urdb/urdb.html).

Appendix A. Tirekicker Comments

A1 Discussion Notes About the Earth Science Search Tool (ESST)

Icons:

- Had trouble reading the icons and figuring them out as to which is which.
- Liked the idea of the "balloon help" concept on the attribute icons.
- Locality type was not what I had expected.
- I would reduce the icons for the topic and parameter icons.
- The pictures [on the icons] don't help.

ESST Layout:

- Need to check out what this stuff looks like on a smaller screen [15 inch screen]
- Do you develop and then display or display as you develop?
- Have no yet examined the font size issues.
- What about the number of screens that are required?
- The font size will affect the real estate options so it should not be left to the end.
- There is more to developing a program than re-sizing the screen, what do we do when the small windows displayed on the small screen. Can't have any windows displayed side-by-side.
- Want to be able to scroll within each attribute window.
- User customizable fields would be great and go a long way to solving the small screen.

Features Requested/Designs Recommended:

- Little use to have done everything graphically and at the results screen there is no graphical help, I only have lat/long. Need some type of granule summary screen.
- User customizable fields would be great and go a long way to solving the small screen.
- Mapping the granule coverage to a map and timeline would be helpful. In a separate window from the results summary. - A results coverage map
- How does the display look if you re-aggregate by a different parameter? - the collection information would go away.
- Is it possible to let the users decide which of the panels go where? The service panels on the left of the attribute, the attributes in my own priority order.
- The system doesn't allow a user to search for data along a route (say the flightline from NYC to Praetoria). - How can I get the granules that lie along this flight line? - What about querying on a line?
- Want to click on the map from the summary window.
- When will we see the prototypes for the map and timeline tool? EP7 timeframe.
- The original EP6 maps were interesting but the buttons looked confusing. We want to make it look more like a drawing too.
- Masking capabilities? Land/water, regions, ice, snow, etc., will these capabilities be provided?
- Easy to reference the lat/long granules to a look-up table to see if it is land/water.

- What were the N/As doing in the Results Screen? May say “open folder.” It may have been the Gateway doing something funny.
- Parameter selection - annoying that it was hard to select more than one parameter at a time. Partially solved by “tear-off” menus.
- What about tear-off menu?
- What about selecting a set of granules and putting them into a “tear off” menu that you could then manipulate?
- What about putting a shopping cart paradigm incorporated into the ESST.
- With multiple searches can a users see a “shopping cart” containing the granules that I have selected.
- May do multiple searches, get multiple/double hits, and order multiple granules, the shopping cart should let you see these types of duplicates.
- What about searching on cost?
- What about a zoom feature that works?

A2 Discussion Notes About the V0 WWW IMS:

Search Screens:

- Didn’t like having to scroll so much. Efficient real estate is a must.
- Index at top of page? That would be a good idea.
- Compressing the items, attribute icons to save real estate.
- Things required for input should be first
- Had trouble getting a valids list because the icon is not clickable-looking.
- Was there a way to search through the valids list?

The Parameters List:

- Maybe want an alphabetical index for the parameter listing.
- Use of alisases is needed. It doesn’t have “rain” in the V0 IMS.
- What about “filters” in the parameter list?
- Clouds gives you everything on Clouds, that is what some tirekickers though would happen but it does not work that way.
- Why can’t the system do the 1st three letters and use that to narrow down the list?

The Map Tool:

- Searching from the map was crude. No zoom.
- Hard to edit the map selection
- The latitudes and longitudes do not update the map but if you update the map the lat/long fields are updated.

Other:

- The time information “the minimum time period for the dataset.”
- I worry about the situation where the user thinks there is no data, or DAACs who don’t have data.

- It is not clear that checking “return granules with browse only “ will limit your search. In reality there could be lots of data but none have browse, the user would never get the datasets as “hits.”
- Data Dictionary is a different effort but you need something readily available and should be available at every point. Like the linked (related links) features.
- One of the biggest shortcomings surfaced when I said, “I know which data I want” Why does it take so many steps?
- Not sure how to interpret the red and blue lights on the results set. No key provided to help the user.
- Why do all the searches have to be complete? It is a limitation of the web technology. You send out one request to multiple data centers you still have to wait. You can use the “Stop” button to stop the request.
- Can you ask the HTML (Gateway?) to send the search results “so far?”
- Can’t tell how much information the DAACs will be sending so there is no way to tell if a DAAC is slow, running and searching simultaneously, or will be sending results once the search was complete.
- Robin likes a NOAA keyword search interface. What about using the interface to enter free text? So it would recognize that AVHRR (= sensor), Clouds (= parameter).
- Isn’t the work of the Data Modeling Working Group going to help this aliasing effort?
- The V0 group (Dan Ziskin reported) is trying to submit aliases with each parameter, however, the group is limited to the aliases they can think of.
- All users will want different things, they should be able to customize their own interface.
- Are we trying to make the client as configurable as possible - the client for everyone at all levels?

Results:

- When a dataset was returned there was no way to tell which parameter(s) caused the “hit.”
- Would like to have a “back mapping” - a list of what caused the “hit.”
- What about putting a weighting on the parameter so that you get a “score” with each hit?
- What about providing a means of “discovery” as to which data are most complete in terms of time. Want the timeline window to be filled in when the results were returned.
- What about “sort by parameter,” just like “sort by date,” etc. This may cause multiple mapping.
- Look at the Langley IMS to see an example of data related in space and time.
- Results: did anyone figure out how to look at the data across sites?

Data Selection/Ordering:

- What about the packaging selection? Couldn’t package all [a]like datasets. No way to package datasets without going back to the shopping cart. Sort of annoying.
- The on-stop shopping concept was not well shown.
- No way to save the search? At least it was not obvious.
- Hard to tell which part of the stages you are saving.
- Want to save the search but there is no session management.
- There is no indication of how many granules are in each dataset.
- Why do you only want 10 granules out of the X granules in the dataset?

- How do I get the rest of the granules in the set? How many granules were there total?
- So do you want some "metadata on the metadata?"
- Not obvious which dataset had the most data.
- The V0 WWW IMS was not easy to prepare a mental integration of the data.

A3 Discussion Notes About the Java Earth Search Tool (JEST):

- Where you get to the order page that is where the money, time, number of granules, and size comes. Can't you get a summary of this or preview before ordering?
- The timeline in Java is good, I like seeing the length of time of a data set and other sets before I even order. Also want to get the volume information.
- May want to make directory data a lot more visually displayed/useful.
- The directory level information may not contain the amount of data information (size).
- Robin says that it was not obvious how/or if you could select multiple datasets at all.
- After you do a preliminary search then display the attributes from a dataset. These attributes may show coincidence, they may also lead the user to other, better datasets.
- Different users refine their searches in very different ways.
- There is no level 4 requirement to extract the granule level metadata to the Client.
- How can I find all of the granules if I hit "the wall?"
- Positives - the applets, doing everything on site. These are critical enough that they nudge my opinion in the direction of Java.
- What can't you do? The security issues are critical.
- Want to make sure that what we develop is stable so that when we release something people aren't stunned and can't use it.

A4 Discussion Notes About the University of Maryland Dynamic Query Interface:

Concepts/Architecture:

- Opinion of the volume on the search prior to the search. - Was the Query Preview hitting the server? Yes.
- The UMCP prototype brings back the Data Collection level metadata.
- The concept is that you make a rough query, then these are refined, then the next level may send the search to the data server for the granule level metadata.

Interface:

- Coverage? Why are there only 18 regional zones? Why not go down to the scale of 10,000?
- The Query Preview is a way to get rid of all things you don't care about.
- Dave Emmitt endorses the extra layer of query refinement.
- The size of the dataset isn't as big a concern as compared to the sampling size! This is a characteristic which makes the data usable.
- Make the Starfield customizable so that the user can display the data that are most useful.
- I like the Java concept because I could customize my own filters (attributes).
- "Where does the search start?"
- All the information used in the UMCP tool can be searched on the Data Dictionary.

Searching on missing metadata:

- What about searching for Events or Conditions?
- What about the datasets with poor metadata or no metadata? May be able to use an exploratory interface to display which attributes the dataset has.
- Can you search on the attribute "no attribute?"
- If the user selects an attribute that some datasets can't answer with metadata then the dataset should be displayed but grayed out.
- Can ECS search blank fields?
- There is nothing in the interface that tells the user where you're searching and where you're not.

Data Recommendations:

- Made a point at PW1 that we [Tirekickers] need to see prototypes with real data.
- What about SAR data collected by the shuttle? There are lots of data that you could use that doesn't fit the nice metadata model. A lot out at NOAA.
Get data from Data Archives to get a representative sample of non-conforming datasets.
- "We've been doing this playing around for a while?" "When will I have a research tool?" - What about the Advertising Service?

A5 Discussion Notes About the Coincidence and Subsetting Mockups:

Coincidence:

- Unclear how much was not possible from the main search screen.
- Is a second screen/dialog box really needed.
- Where and when do you build the coincidence search?
- Shouldn't have to see the results, just need the target dataset.
- Want data collected within one hour (Tolerance) on other parameters
- The search should use the granules to check for coincidence.
- Coincidences in the orbital platforms is desired.
- First order search is to find the granules, it would be nice to see the spatial location of the granules. Want to see where the granules themselves are coincident.
- Results display showed the target collection and then coincident collections, want the capability to re-order by coincident granules.
- Haven't seen anything yet that allows a user to do anything with swaths. It is critical to be able to display swath data.
- I think coincidence search is a Search attribute. Another way to filter data.
- How do you envision the network traffic?
- First search is normal and returns results to session, the second search would go to separate sites (DIMs) and they would be joined at the dataserver accessed by the Client.
- How does this differ from a new search? A coincidence search would specifically form a join between the target dataset attributes/results list and the second search.
- The join will not happen at the client, it may occur at the dataserver where the client is talking to. It all depends on query optimization and agreements/design with the data servers.

- Would like to see a research study of the things required for coincidence. The problem has to be spelled out in a drawing which "below this line" it is too complex/hard to implement.
- Each granule is defined by a bounding rectangle and within the bounding rectangle there are more specific spatial data.
- Worried that users will be mis-led by the precision of the coincidence search, rather bill it as Potential for Coincidence. There is "a lot of slop" in this.
- Do we query algorithms to search "G Rings?" ECS is talking with Illustra to design the database such that they can be searched on.
- What are the universities where we could go for the issues of representing space on a globe - looking towards 2-3 universities who could provide a white paper from the RS/GIS perspective.

Subsetting:

- The interface will have to deal with spatial swath data.
- According to the discussion at the Subsetting Working Group, they would be happy with a rectangle in alignment with the swath. They also agreed not to cut short scan lines - you'll get the whole scan line.
- May want to wait until the SWG report is published.
- When I submit my search query I want the subset to be the same as my smaller regional spatial area where the global data are subset. The entered spatial coordinates are the default for the subsetting.
- What about the temporal subsetting aspect? It may depend on the dataset, some may want to use it, others may not be able to use it. The services will be displayed according to the information in Appendix F of the DID 304.
- Have you thought about subsampling and Summary in addition to subsetting?
- The services within the Appendix F matrix may define the services.
- Is Summary a statistical toolkit? Averages, means, histograms, contour plots.
- Averaging may be considered as analysis.
- Should it be created by the instrument teams? This is analysis.
- If the Summary is "percent cloud cover" and stuff like that in the metadata then will ECS provide tools that we can use to view the data?

Appendix B. Observer Notes

B1 Notes on the Earth Science Search Tool (ESST):

You are a researcher interested in precipitation data over the Gulf of Mexico and the Pacific Ocean off the coast of the Baja Peninsula. You are particularly interested in examining the relationship between changes in salinity and algal blooms within these two areas. To study this problem you have amassed a database containing information on salinity, currents, pollution, fish catches, ocean color, and algal blooms over the course of this century. Today you would like to search for and order precipitation data for Gulf of Mexico and the Pacific Ocean off the coast of the Baja Peninsula.

Task 1

Access the Earth Science Search Tool from the PW2 Desktop.

Because you are not too familiar with the Search Tool you spend some time reviewing the layout of items within the Search Tool window. You notice that there are a number of attributes shown as colorful icons in the Attribute Toolbar. You wonder which other attributes are available? Access the Attribute Selection Tool to find out.

- Pull-down name should be something like “attribute selection tool” or “change attributes”
- Desensitize for tool bar if not working.
- Attribute Selection Tool: Delete and Add - need arrows to indicate where they apply, there should be a way to save attribute sets options.
- “Change Icon bar” does the same thing as “Change Attributes” Button - inconsistent names.
- Sensor label is not consistent from the main to the Attribute Selection Tool.
- “Close” means “Cancel” is it right?
- Suggestion that “Close” = “Cancel.” and “Apply” = “OK” or “Accept.”
- “Top Parameter” = “Parameter Group/Discipline.”
- Inconsistency in using lower case vs. upper case for valids.
- No acronym used for valids - PLEASE.

Task 2

The Attribute Selection Tool contains a number of attributes which you may use to search for the precipitation data you need. Use the Attribute Selection Tool to customize the Attribute Toolbar.

- Tried “Add” and “Close” = lost attributes. Then learned that had to use “Apply” - may want to use “Save” instead.
- In “moused out” geographic region the zoom should fill selected area, not whole screen.
- Need a way in the attribute selection window to get help on an attribute so you know whether or not to pick it and also a tool to query what attributes mean, before the selection would be.
- When attributes are added, they should be appended to the end of the existing list rather than thrown in between existing items.

- Locality type isn't what users thought it would be. He thought it would allow him to select a qualifier or modifier on data origin of collections. e.g. a DAAC may have a lot of data but it may come from other locations. Like one step closer to the source. Thought it would be site-specific. Locality type implies geography but it also includes temporal information.
- The attribute Selection tool "Apply" button seems redundant.
- Locality type doesn't seem to be the right term for the options it gives, e.g., 10-day composites, monthly averages.
- Deleting all attributes crashes system.

Task 3

Using the attributes available through the Attribute Toolbar, construct a search for precipitation data for the Gulf of Mexico. Use the spatial and temporal attribute tools to enter the geographic area(s) and time period(s) for which you are interested.

When you have finished constructing your search, submit the search to ECS for processing.

- Results window had re-size, scroll bar, etc. problems.
- It would be helpful to be able to add or narrow search criteria from results window. For example, one might want to add a browse search to results.
- Pointed out how "save attributes" should work.
- Temporal selection graphics - looks like can select ranges and then not - not consistent. Looks like it records multiple temporal ranges but does not show them graphically.
- Not clear how to delete item (value) from temporal list. Seen in search screens. Might make delete capability available in the temporal selection screen.
- What is happening in the temporal summary, it shows black and dark blue patches - ambiguous. Re-display made temporal summary standout. Might not handle multiple ranges.
- Can't easily select multiple parameter items. User selects, closes, then needs to re-open.
- Icons should be changed when it is selectable.
- When the icon is on the spatial region in the main window, there should be a message to guide users to click on the "Spatial" button.
- (x,y), (z,q) has no meaning to some users.
- User tends to make a selection at the bottom than first.
- Should use a single color rather than "black and yellow."
- Colors represent the timeline changed all the time.
- "Clear All" takes care of everything but "Temporal"
- The text in the message box should be bigger.
- There should be graphics to indicate the waiting period necessary.
- Should have an "Abort" button.
- Geographic: Zoom doesn't work, only zooms in on US.
- Spatial summary default (gray map) is misleading, user wants to draw in spatial summary map, rather than pulling up spatial selection window.
- Geographic selection: if user selects "Update/Close" without selecting an area, the display of existing area selections disappears from the main ESST map.
- Deleting temporal selection range with "Delete Attribute" button crashes ESST.
- "Search" menu in ESST should be renamed "File."
- Timeline window buggy. First time brought up doesn't look right.

- "Clear All" doesn't clear "Temporal Summary" display.
- In general, text should be bigger.
- Needs V0-like "search processing" windows with dynamic updating of search status and listing of search parameters.
- Shrinking search window to icon should place icon in front of main ESST window.
- Was confused on the propagation of constraints into the temporal selection tool. Constraints did not seem to propagate. Timeline reflects local holdings, not system-wide holdings.
- Valids for DAAC contains campaign/projects these should have their own attributes icon.
- 3 buttons on change attribute button looks like it should have 3 options or do 3 different things.
- Need to be able to type in geographic coordinates - point, polygon, rectangle, point and lat/long range or target with area.
- Also need a temporal type in area.
- Zoom needs to zoom on an area you select. It currently seems to zoom toward upper left corner.
- Lag in temporal range selection, screen update, is a problem because you keep clicking/selecting which modifies your initial input.
- Selecting second area lost the prior map selection display - coordinates in the attribute selection box did remain.
- Letters on the icons are too small
- Need step search button.
- Nice to select areas on map at the same time.
- During search there needs to be a clock or other indicator that search is in progress.
- How do you select one of the poles?
- How about using a 3-D globe representation instead of a projection map.
- Icons should be clear to read.
- The order in which new attributes appear in the tool bar should be at the end.
- Want to be able to select map information right from the main screen.
- Zoom doesn't move to the center of cursor, the more you zoom the harder it is to pan.
- Panning is relatively easy with PW2.

Task 4

Using the attributes available through the Attribute Toolbar, construct another search while the first search is being processed. Construct a search for precipitation data for the Pacific Ocean off the coast of the Baja Peninsula. Use the spatial and temporal attribute tools to enter the geographic area(s) and time period(s) for which you are interested.

When you have finished constructing your search, submit the search to ECS for processing.

- System core dumped. Search not simultaneous.
- When search is submitted - need some kind of search status information. More time-busy cursor (which is also missing). Show status messages. Would it be possible to estimate time of search and progress towards returning results?
- Can't find way to abort a search.
- Nice to apply "shopping cart" concept/service in results area to capture items for ordering.
- Outer scroll bar for results screen doesn't work
- The cursor never changed - should do something about it.

- Always display the waiting message at the top layer on screen - never hide it behind the main window no matter what the user does.
- there should be a button to abort to cancel the search.
- The “Quit” item in the “Search” pull-down menu is misleading. “Quit” should be on the main menu ‘called “File”
- Want to see bigger font size for the text in the User Interface.
- “Topic Parameter” icon has no meaning.
- “Parameter” icon means collection.
- Trying to enter criteria for a second search, the ESST crashed.
- The Tirekicker wants services and has deviated fro the exercise in order to see if any services are available. Once we understood that no services are available....
- the Tirekicker became frustrated that the time took too long. Frustrated that there is no “Stop” button.
- Should be able to save query.
- Timeline selection (yellow rectangle) does not always work.
- Have a submit search window for each search with date, time, etc. or name.
- Looks like dataset list in timeline is not dependent on the other selections e.g., parameter.
- System returns granules from times/dates outside of search criteria.
- Specifying criteria for a second search before results were returned crashed the system.

Task 5

The system has processed your query and the results have been returned. Examine the Results Lists. Open up the collection-level information to reveal the list of granules contained within each data collection. Some of the granules contain browse images, select one or two from each results list to view.

- Shopping cart concept would be nice to implement in the results screen.
- If you open a collection and select granules, then close the list, the check box does not indicate that you have selected granules for order for that collection - the information is hidden.
- Might use way to display that with a different checkbox design. An example of a filled checkbox and a half-filled in check box are displayed.
- Vertical bar in the “Service” doesn’t work.
- When opening a folder for “Collection” the icon is changed but not obvious - make it more obvious.
- Should show the granule ID
- Should show which granules have been selected.
- Cannot view the spatial coordinates for each granule
- Must have a scrollbar for every attribute
- Why use “bold” characters in the Attribute section, should have a map in the results window to display the location of the granules.
- Scroll bar under “Collections and Granules” on the Results Window doesn’t work.
- What if a single collection is indexed by more than one parameter? Can “Parameter” attribute field display more than one value?
- Vertical scrollbar non-functional?

- If user selects a few individual granules from within the collection, then closes the collection folder the checkbox...
- Sub-fields within attribute field have no scroll bar - MUST have separate scroll bar for every field and subfield.
- Lat/Long values should ideally be replaced by map - clicking on granule puts spatial limits on map.
- There was no browse icon for our results. Collection level attribute values are not displayed at collection level.
- Right scroll bar did not work.
- The left white icons did not expand with collection.
- Lots of N/As in the collection level attribute data, but metadata is available at the granule level.
- the vertical scroll bar doesn't work.
- If there is a "Stop" button to abort a search the user couldn't find it. User desired that feature.

B2 Notes on the V0 WWW IMS:

You are a grad student working for an EOS Principal Investigator. This PI is interested in finding meteorological information to support her research. She knows that there is a good deal of data on clouds and precipitation in the V0 IMS: she is interested in any such data for the Gulf of Mexico.

Through your search on the World Wide Web, you have discovered the IMS/WWW interface to the EOSDIS V0 IMS (http://eos.nasa.gov/imswelcome). Run your favorite browser, and go to this page.

Task 1

On the IMS/WWW home page, you *skim* through the description of the V0 IMS, the current features, and the "Helpful Hints" section. Remember: like most users, you are only moderately patient when it comes to reading documentation.

The "Browser Test Form" catches your eye: you run through it to see if your browser can run the interface.

When you have completed the Browser Test Form, go back to the "welcome" page and hit the "new search" button.

- Why is the Desktop not named "Desktop" on the top of the window [the window is labeled with the users path/directory]
- When the user double clicks on the Desktop the arrow should change to a stopwatch.
- Why does the user want the "design manual?" This sort of information is probably more important to developers and such, it should not be on this level of the interface. Maybe [the V0 WWW IMS developers] want to find out which kind of user is logged on and not show it to Science users.
- Clicked the "Netscape Now" button and was confused as to why the button was on the V0 WWW interface. When it was explained that it was available so that users could download the latest version of the browser software, the Tirekicker comment was, "The system Administrator does that."

- Hard to order what you want (must go through all annoying steps) e.g., must select package for each instead of telling the defaults. OK, can do groups by assigning all “Like” granules in shopping cart.
- First time for Tirekicker on the V0 WWW IMS page. Took time to familiarize himself with the entire page.
- Preferences download - upload were good
- Simply page/screen by using links for collapsing/burying text.

Browser Test Form:

- awkward
- should be able to detect which Browser you are using.
- This form is instructing the user to update or change version of browser.
- how much should the user be involved - inform what functionality they would have or high level of problems they are encountering without change.
- ideal - have system detect and advise.
- Didn’t like the way the browser upgrade was handled.

Task 2

Construct a search for precipitation and cloud data for the Gulf of Mexico. Enter a time range, specifying from the beginning of 1944 through to the end of 1994.

Make sure you only ask for data with browse products.

When you have finished constructing your query, start your search.

[The interface] should provide a “Find” option, instead why “Find” from Netscape? User wants to use it to find “Clouds” and “Precipitation.” Would be useful to have “Find” accept misspellings.
- Aliases should be made available.
- Never go through the whole list
- Emphasize the “OR” between different attributes
- Assume an “OR” among valids within an attribute.
- The user didn’t try to select an area, but later asked for one.
- User clicked on “granules” to find the definition. Granule definition is off. It is not easy to interpret.
- The User hit “back” and got a “data missing” error.
- The user reacted positively to the use of icons
- Wording problem - the difference between “granules” and a “list of granules.”
- User wants to see the number of available datasets and metadata information.
- The “browse” product button is no use because some data set satisfies the criteria but some don’t have browse products.
- No Preferences to parameter grouping
- maybe there are a lot of granules
- a parameter may belong to several groups.
- After submitting dates - would be nice to then go to same place in search page.

- Need better method for quick search for parameter selection, other than scrolling down long list.
- Date: display defaults relating to current data selection.
- Region: Blue “hot link” for map not intuitive as used in hyperlink text. Need to zoom into area after each rubber band to refine search
- General: after selection Netscape puts you at top of page as opposed to where you were.
- Looked at the directions and was surprised that “previous” didn’t return him to the search page, instead it went to the previous page of the help document.
- Document navigation buttons need a title.
- Want to type the “cl” to get all the cloud parameters (like “cc:Mail.”)
- Checked the DEF button and read definition.
- Within the parameters list make the OK button more noticeable, user selected search parameter and then clicked “back.” Thought the “OK” button looked more like a header/separator than a button. Can the color be changed?
- There are many OK buttons, it isn’t clear that each OK takes the user back to the search screen, our Tirekicker thought each OK button went with each section.
- Tirekicker not clear at first how to access the map tool, then was not sure which corner of the search area he should select first.
- Error message: filled in the date format incorrectly and got an error message, however, it was not clear what to do to correct the error. User wants to be able to type in 94 or 1994.
- Start Search button should be colored green.
- loses old points if re-selected.
- point and select each corner not completely intuitive - impulse to use point and drag for solution.
- Note, user thought “clouds” would give the user all of the cloud-related attributes, de-selected cloud cover and selected clouds.
- Date range entry: coach coached on format. Wondered what defaults occur in time field - assumed 0s. Didn’t realize that would cut out his last date.
- Definition of cloud cover is missing - when Clouds is hit, it is defined by other parameters. All parameters are not equal, there is a hierarchy. There is a boatload of problems with the list.
- The user has become distracted by the ambiguity of the list.
- The user became distracted trying to see if the map was zoomable. Not clear that the map was hotlinked to the actual big map. User doesn’t understand what a granule is.
- The search button is rather inconspicuous.
- The “In Progress” area was nice.
- The ability to zoom on the map was not apparent or obvious.
- The Submit button was too obscure.
- During free time, tirekicker did search for Landsat data and did get search rejected with message to narrow criteria. He did not immediately notice the message and did not know exactly what to do or what the problem was.

Task 3

After you submit your search the "Search In Progress..." announcement appears. Link to "Communication Status" page.

Your search is completed. Go to the dataset listing page to view your results.

- What does the circle with line through it symbol mean? While it has the message "Searching?
- What do the blue/red (green/red?) boxes mean?
- Why need the 3 blue buttons?
- Want to do something else while the search is in progress.
- Want to see a dataset that has been returned. Can the user search for other datasets while the search is still in progress?
- User wants legend for symbols used on the "Communication Status" screen.
- Can search continue in background while he starts browsing?
- "Communication Status" OK but need descriptions of the symbols used. Number of granules is only current, not the total. Asked for a maximum 15 and the search went on to many more.
- Dataset listings shows 15 granules as opposed to what was listed in the Communications Status.
- Liked the Communication Status page.
- Search in Progress blinking - the flashing "in progress" is redundant.
- Keep the extra activity bar at the bottom of screen redundant during Search in Progress. [??]
- Be able to see results that have been returned even while others are being returned would be nice, like in the V0 GUI.
- Does not indicate that you can or can not look at returned results while others are in progress.
- Question about what it means to only get 4 DAACs back, what the circle with slash through it meant vs. the check mark.
- User hit information on a number of pages. User wants most accurate data. user can't decide which of the data sets to order. Really needs to look at browse imagery. Doesn't understand if it is too late to get browse imagery.
- Went all the way back to re-parameterize the search. Does he hit a button or not on the communications screen? The messages are contradictory.
- He hit communication status anyway.
- Retrospect: the user didn't know if he could do a boolean AND in the search.
- Liked the time update
- contradictory messages are given to the user - Stop, do nothing; or continue to search screen.
- Confused over the definition of a granule
- "Data Set Listing" link is above search status results.

Task 4

You decide you want to see the results organized by start date, instead of alphabetically. Make the appropriate selections.

- Clicked on "List of Granules" and got error messages.
- The same data sets may be held in different DAACs - want to see the DAAC of the dataset before making a selection.
- Select datasets - select granules - shopping cart
- Reset button doesn't work.
- Don't click on "Reset" at all.
- Didn't press the actual sort button. Two step procedure - did first step but got lost on the second step - the actual sort step, although the button was there.
- There is no option to select all datasets

- The information doesn't say why he got this data set - what did he specify that produced this data set?
- Broad search (precip and clouds) but no traceability to parameters was not under "attributes" as expected.
- Selected the resort by date but never hit "resort" to activate the re-sorting process.
- Re-sort - given last - select then click to resort. Could save a step by starting the re-sort once you have selected on "by ..." type.
- Would like a choice of ascending or descending sort, not one provided. Default currently is ascending but not clear.
- Piece of cake to re-sort.

Task 5

Pick a dataset or two and try to determine the following:

* What are their attributes?

* What information is available about them?

* What actual data granules were returned from them?

Find a data set which has at least some granules for which you can view the browse products. Get a granule listing of those granules.

- Click on "Brief Info" to learn about the datasets.
- "Data M___" problem.
|- Stop date is better than End Date
- Used "shopping cart" here but looks the same as "granule list"
- Missing view of time coverage with returned data (asked for 1944-1994)
- "Brief Info" was too brief, (did not go to the GCMD).
- One dataset level - once selected a subset - don't want to see non-subsetted data.
- Curious about what shopping cart is. Got error "Bad query/request. No datasets selected..." - but user selected 2? Second time it worked, it turns out they were de-selected.
- Clicked on "DEF" and ":DI", not sure what the DI results were for.
- Selected "granules" and got the definition of granules, the user was expecting a list of granules.
- Clicked on the "BI" button and got a DIF display.
- Not all attributes for DS clear.
- "comments" would be good.
- Dataset attributes need to be clearly labeled. Upon first glance can't see quickly what is new in this screen from screen on dataset listing.
- Quick list of sensors
- Fount attributes expected in "Brief Info" expect to see the structure for "Brief Info" when entering dataset attributes.
- Granule List: granule attributes screen made more sense and was what was expected.
- Didn't occur to select multiple datasets then get granules. This system does not promote one-stop shopping cause the user doesn't realize he can do that.
- Granules were available for interactive browse but FTP option was turned off - this should have also been active.
- DI goes to catalog - not the data center guide - this needs to be fixed.

- Definitions aren't populated yet.
- Guide link went to glossary
- User didn't use the detailed info icon, also, the DI button under data center was expected to give the same results as the detailed info icon.
- Guide access does not work as it should.

Task 6

Pick a granule or two and try to determine the following:

* What are their attributes?

* What information is available about them?

Pick a browseable granule, and look at its browse product. Try to download the HDF file to your machine.

- Look for the time
- not successful at using the browse product.
- suggest using "de-select" or "unselect"
- Not obvious to know if the granule is an FTP or a browse product.
- Because of the comm layer software problems, had difficulty with browse, kept failing.
- Couldn't get the browse files
- Can only view browse when there is a list of granules.
- When browsing a granule...how to select it? Have to back a page? Got back (to top of page) but he [the user?] has to remember which granule from list.
- Had to reload and lost selected datasets and had to re-select it.
- Does putting into shopping cart = select granules?
When granule is displayed can't select it. Only by going back to the Shopping Cart.
- When going back/forth between Shopping Cart and Browse you don't know which granules you've viewed (not tagged).
- "Gray" out of on-line vs. ftp browse not consistent (uses "green").
- When error occurs: Couldn't backtrack, had to reload page, then all granules were un-selected.
- FTP browse caused an error.
- Unable to access browse image.
- "Campaign" definition not found.
- Could not download a browse.
- Abbreviations such as "FYI" are not good for an international audience.
- Tirekicker not able to get browse on first 3 attempts.
- "The last search you submitted was found..."
- Data entry [??] - had entries that were not part of the original search criteria.
- Def and [??] buttons stand out, can distract from the information displayed.
- multiple uses for hyperlinks - can be confusing or [??] e.g., Data Center - hyperlink gets definition also button for definition gets definition.
- buttons vs. hyperlinks: which one has less intrusive and when are useful - to avoid distraction or to draw attention.
- Question about help - available on some options and not on others in Browse granule list?

- Sage2 cloud product: granule had multiple browses listed for downloading but user thought he was looking at only one browse. Display needs to be more informative to handle multiple browse images.
- The icons associated with all of the CHFs [??] was confusing. Needs more instruction here.
- Needs browse description the user can't figure out what the difference is in the various layers. Also, user thought you had to select the selected granule or select datasets button to get attributes for that one item.
- Guide access is a bad design - it shouldn't go to the catalog.
- view browse should be available from the granule attributes page - or any of the granule level pages.
- The bar of icon options at the top of some pages needs to be on all pages. User got hung up in some areas because the navigation wasn't intuitive.
- Just going "back" takes a long time! User states the reason he doesn't use web much is because BAD performance. He doesn't believe scientists will be able to get through the amount of information and data they need, in a timely manner, for this to be real useful.
- Client failure on Browse.

- User doesn't know what an HDF is. Hopes it has an ASCII header. Didn't mess with HDF.

Task 7

You have found a few interesting granules from a total of one or two different data sets. Select these granules for ordering. Put them in your "shopping cart".

- Didn't understand that after packages are selected, then press order and then fill in contact information, then order. First time for user to order from interface. Didn't know which step would end the order process until finally completed and got order summary information.
- Web IMS is harder than original IMS
- "I didn't know what this Shopping Cart does!"
- Found "put selected granules into shopping cart" in granules list.
- In Browse should have used "Data Set Listing?" - unselected his granules again.
- Confusion over if he did put his granules in shopping cart; if so, how many...put all granules of selected data sets instead of selected granules (did things out of order).
- Shopping Cart: Display what the search criteria were that resulted in that particular dataset.
- Data Set Listing: Display what the search criteria were that resulted in that particular dataset.
- Data Set Listing: - the long listing does not provide graphical timeline display of data hits (note the query is for a long time range.).
- Select data sets they need to list them only (not the entire list).
- Data sets were unselected a couple of times when...
- Shopping Cart then only lists granules on at a data set level.
- A symbol for attribute not intuitive (when granule is displayed).
- Tirekicker liked the Shopping Cart "good and valuable idea for implementation."
- Granule Screen: When selecting for shopping cart...Should be someway to get back to granule list screen use icon as [??] go back to full granule list, back vs. goto capability.
- Summary screen for shopping cart. Selected list might expand to accommodate information on options for processing.

- Shipping personal profiles appears in “given below” button to copy profile information into Billing - good. Need to confirm, was it missing in the initial user profile?
- User comments: Hitting granule list is one way to look at specifics but you also expect to get something through “select item.” But select item also seems to be the next logical step in the workflow but it doesn’t seem to do anything. Select granule - select for what? It is not intuitive.
- Observer note: The actions you should be able to do on multiple granules should include viewing attempts, guide, and directory information.
- User didn’t want to spend too much time on this.

Task 8

Select any one of your granules, and ask to choose a package for it. Keep choosing packages until you have done so for all granules in your shopping cart.

- The system shouldn’t pick a granule in the shopping cart.
- Cannot de-select a granule on the table, only some selections allowed.
- Add a button for “Granule Listing.”
- A button for “Save” should e on top
- A button to Clear the whole screen too.
- “Erase Form” “Initialize Form” should be on top.
- Wanted to know if he had to choose a package for each granule. After being coached about the button to give same package options to all granules from a dataset in shopping cart, user that option and seemed to like the convenience factor of it.
- Confused about granule vs. package vs. package of multiple granules, etc.
- Why do I need to select a granule to choose a package? Don’t need to select...
- I wonder what help does?

- Using buttons at top to navigate but they were not always visible.
- Want to choose a package and get list of all granules at once, rather than going back and forth for each.
- Found tiny print at bottom of choose package to assign for all in shopping cart but not all granules had “TAR compressed” it didn’t seem to work. Didn’t want to order all these granules - confusing with respect to the “Select” button role vs. cart contents.
- Much too awkward “annoying” especially if there are dozens of granules.
- If Choose Package is “grayed out” does that mean that Data is not available for the order? If so, why is the user able to put it into the Shopping Cart?
- Choose Package: hit once then apply to all granules didn’t work!! “OK hidden at bottom of screen only.
- Buttons for navigation are only at top of page.
- Why only one package can e ordered at a time? (radio button)
- Tirekicker would like to order same package in different media with same order.
- Clicked on the “directions” didn’t like the idea of only one choice of package.
- User found the Choose Package table very confusing. Wanted to be able to select help on the media format information.
- Thought that “processing option” should be relabeled as “processing type.”
- The Tirekicker did not seem confused about the need to “choose a package” but the Observer for that tirekicker was.

- Media format may not be known to non-programmer types, need help information on it, description of media format, etc.
- Processing Options - confusing. The word “option” implies that it needs to be selected, it was not selectable (ie, highlightable) within the box, but by a radio button at one end of the table. Not clear to tirekicker that the radio button would select the desired Processing Option and other items within the same row.
- Wondered why there was a little help button next to only one “select granule” button?
- There is a lot of stuff you have to read going through this that makes it difficult for the first timeuser. A bad first experience.
- User doesn’t know what “packaging” is. Would be better as either Physical media selection” or “Shipping method.”
- Doesn’t have access to information necessary to do a cost/benefit analysis.
- User doesn’t know where he is in the overall process search and order.
- Not intuitive that you need to choose a package until you see all of the options.
- Note: did not read the * marking option until trying to fill out the survey.

Task 9

Fill out the order form. Supply a valid email address, etc., but give your first name as "Just" and your last name as "Kidding".

** NOTE: saying that you are "Just Kidding" is VERY IMPORTANT: otherwise, the data order will go through!!!!

Submit your order.

- Wanted the capability to save contact information between sessions.
- User typed city name in street address portion of contact information.
- Why did user keep getting data missing causing a need to reload?
- Disk cache lockedout because of multiple pages.

- User had to do a reload and lost his order form. The order information should be cashed.
- Clicked on Help and the system erased everything! Had to reload.
- The “same as address” should be default.
- There is no way to go “back” to the order form without reloading, losing all the data and retyping.
- Should have a “back” button so that user can see the contents of the previous screen.
- “Empty Shopping Cart” should not be a default.
- Difficult to return to form after error messages.
- Lost information entered in the sending biling screen after encountering [??] [??] missing mandatory fields i.e., phone.
- go back to [??] but all information had been erased. Had to re-enter all information. - Bad.
- Suggestions, save order number in order to track order status.
- when using back, retrieving the manifest document get a missing data cashing problem used reload to get back to manifest.
- Empty shopping cart - ambiguous.

- User did not have the opportunity to confirm the address information before submitting requests.
- Order number too long

Task 10

Wait for and examine your shipping manifest.

- default to Empty Shopping Cart was not noticed - surprised tirekicker after he submitted the order it informed you that the shopping cart was emptied.
- Issue: should default actions be to empty information for order (to destroy data)?
-Selected from data set Listing Screen: - had trouble getting back to Dataset Listing after submitting the order - appears to have emptied search results got an error: "no data sets satisfied your search..."
- He had typed in a middle initial, then backspace/deleted it, but it showed up in his address anyway on the manifest.

General V0 WWW IMS Comments Recorded by Observers:

- User used on-line help extensively.
- A little confused about navigation buttons initially but after coaching, adapted to it.
- Didn't notice the variety of maps available
- Need more detail in the map
- Granule List "Attribute" button - didn't understand that contained the granule inventory description.
- Should make some fields in the Order Contact information optional.
- "Street Address" beside address input panel down too low. User missed associating it with the input panel.
- User confused a lot about whether he's in granule list or dataset list. Maybe a different look is needed - different background color, etc.?
- Because at least 10 simultaneous sessions are going, there are disk cache problems. Need to re-look that.
- User like the "DEF" button from the search parameter page. Liked the on-line data dictionary aspect of it.
- Did not like the fact that he had to write down the order number.
- New search uses previously cashed search criteria - this is confusing.
- Data set listing on the search completed page should be a button, not a link.
- Problems with stateless systems period: if things are interrupted, no resume.
- The Granule definition is insufficient in Glossary. More detail needed. Physical granule: is that one file?, Logical granule: Multiple files same DAAC or multiple files multiple DAACs?
- Why does going "back" involve reload?
- Shopping cart icon looks like trash icon.
- there is excessive text ornamentation.
- User desired a filter on granule cost
- User liked the shopping cart model - pretty intuitive.
- Note: Tirekicker had used the gateway a couple of times in the last several months.

B3 Notes on the Java Earth Search Tool (JEST):

You are a researcher who has developed a climate model. An input to the model is precipitation. You have already collected data on solar radiation, temperatures, and land cover types/classes. Today you are looking for precipitation data from the 1972-1983, over North America. These data will help you refine your climate model.

Task 1

Create a new search by selecting the desired attributes from the set of available attributes. Be sure to select the Spatial attribute icon and include it in the attribute set, please do not select the Temporal icon. Give the set a name and save it.

- The user didn't not know what the attribute selection step was for.
- Problem:
  - lost values to atributes when selected.
  - confusion on "searches" and "create new search."
  - icon for Site and Site not clear that is for an "archive" use archive.
- PS. Crossed out the wrong "S" in JEXST, should be JESXT.
- User asked "what is 'name of set'?" = confusion.
- Should move the 'name of set' to the bottom
- Should change the 'name of set' to something else more meaningful.
- The global icon rotation is also confusing.
- user was confused by having to enter a search name then selecting attributes.
- User read the help on the screen, he didn't check the help button.
- Tirekicker seemed to grasp the meaning of the attribute selection step.
- Selected parameter group. didn't know where the "precipitation" attribute "lived." Kept going back to New Attribute Set screen, then looked at "Parameter Group" criteria. Couldn't find "Precipitation."- At fourth search selected "Parameter Topic" and found "Precipitation."
- Tirekicker didn't think that checkbox looked like a checkbox.
- Not sure if "create new search" saves it.
- Font for search parameters screen is very small - too small to see from 3 feet.
- Temporal resolution - corresponding colors between location of timeline is nice.

Task 2

Construct a search using the attributes saved in the previous step.

When you have constructed the search, submit your search.

- User had trouble zooming on map, the arrows weren't labeled.
- User found panning and zooming difficult.
- Difficult, non-intuitive in what to do with arrows on pan and zoom functions.
- Spatial search, zoom not easy to use. Functions of the arrows on map unclear. Had to experiment to learn what they did. didn't work effectively.
- Pan and zoom functions not clear.
- Want to se selection box next time return selection map.
- Want to see coordinates displayed on screen at same place where they are selected (graphically)
- Save multiple screens would be good.

- Temporal Selection: Need persistence for data collection information scrolling (when you move the cursor out you lose the information).
  - want to summary the temporal and lost temporal selections (time information and summary information).
- Search results, go back to query screen, then try to go back to search results - can't find out how.
- Would like to see the shopping cart concept in Search Results.
- confusion between attributes and searches regarding what was saved.
- Saved attribute set come up as an item under searches?
- might want to capture search attribute sets in user profile and call them up for display and reuse at top of search screen.
- User had trouble zooming on map.
- User has no idea of how to pan and zoom the selected area.
- the arrows around the global icons are not working for the user at all - user has a hard time using it.
- User wants to see all the icons of the attributes displayed at the top.
- User doesn't like the graphical map selection window. There doesn't seem to be independent control over x and y lengths of the map selection area, e.g., he could control the x but the y expanded on its own.
- selected map area, "saved coordinates," having difficulty to go back to current the higher level search criteria screen.
- When go back to geographic selection and change coordinates, system needs to confirm if user wants to supersede previous entry or add it as an additional search area. The old criteria should be left up for reference in selecting the second area.
- He didn't try to zoom in on the map, afterwards he go curious as to what those buttons on the bottom were and stumbled on to it. He wanted to spin the globe to ID an area to focus the zoom in on the upper map. Then got an error message in trying to zoom map coverage never came back up.
- the bent arrows along side the spinning globe were interpreted as spin arrows the N, S, E, W arrows were interpreted as an ability to select a focus area.
- Tirekicker didn't know that there was a zoom capability.
- Likes the map and lat/long display.
- cancel didn't work, why do we need it?
- Had to save then continue.
- Had guidance to find "continue" button and search option found.

Task 3

Review your search results. There are far too many hits than you were expecting. You realize that you forgot to select a time range for your search.

Once you have finished examining the results, answer the survey questions and continue with the next task.

- Understood that results are just examples but :
  - available services are different for collections and their granules.
  - processing level both collection and granule - is this true?

  - entries under attributes incorrect e.g., local by 10-day composite.
- User doesn't know how to identify collections and granule table.
- After receiving help from the coach the user selected a collection name to see a lot of granules below.
- At results summary he hit the continue button expecting more results, instead it took him back to the search criteria page.
- then there wasn't a direct way to go back to his results - he had to submit the search again!
- Results display doesn't allow for looking at granules across datasets - you have to look at them one dataset at a time - this doesn't support the one-stop shopping concept.
- didn't understand what step should come next when looking at results screen - what should he do?
- Went back to same search but had to re-enter the previously selected attributes.
- He then tried to go back to older search, had problems figuring out how with combinations of buttons there.
- Liked the 1 km NDVI.
- Want to be able to rubber band select and type in geographic coordinates.

Task 4

Select a previously saved search and modify the list of attributes. Be sure to select the Temporal attribute icon and include it in the attribute set. Save the new search attribute list.

- User likes the graphical representation of temporal attributes.
- Things that user doesn't like:
  - not user-friendly
  - terminology used not common.
- Change "search attributes" to "search criteria."
- User wanted to call up old search file and make modifications then give it a name but the system replaces the file he called up. He wanted it saved as a second file.
- When the tirekicker returned to modify a previous set he selected "change attribute set" then selected the update attribute set but this doesn't seem to work.
- Tried to give the attribute set a new name but it didn't seem to work.
- Did "select" then went to "New Search" the "Change attributes" button was not obvious enough.
- Bug - can't scroll Data Collection information because cursor must remain on Dataset graphic collection bar.
- Problem: When to save or not - need consistent strategy.
  - limited (inadequate) verification of user actions actually taken.
  - missing detailed information on collections
- liked features to graphically select timeframe (temporal attribute)
- awkward to click <checkbox> Name and then "Select" button.

Task 5

Refine your search using the Temporal tool.

- Problem in scrolling through the data collection information when moving from timeline to scroll bars, information disappears.

- User got help from a coach to use toolbar.
- user explored the datasets by highlighting them but found it difficult to keep the collections to stay in the table.
- He clicked the mouse to get a start time then tried to reposition the mouse to click the end time but it didn't work that way.
- Scroll bar below character entry doesn't seem to be tied to the activated entry box.
- If the user enters/edits time information in an entry box they should show up on the graphical box. If there are multiple in the list you should be able to select any one for display in the graphical box.
- He didn't seem to realize that highlighting datasets by DAAC site on timeline tool, was a functionality After it was pointed out to him, he started to try it out.
- Problem: Based on cursor position, the Collection Information panel held information. But that panel sometimes needed to be scrolled to the right to see complete information. However, if the cursor left the temporal dataset graphs, then the collection information panel became blank and couldn't be scrolled over.
- Put dates at the top of the temporal timeline tool.
- Subtitle under "services" was very small (too small to read if you are sitting over someone's shoulder).
- Would be nice to say why a collection can not be browsed.
- How to get back to the results? e.g., name1.results, name2.results

Task 6

Submit your search. When the results are returned, examine the results and select items you wish to order. Submit your order.

- why can some datasets be ordered, some can't but all have browse?
- Why is there a continue off the Results Set?
- This looks a lot like the ESST
- No dependent valids. This would be a problem.
- Good: likes like you can select an entire dataset and/or select granules within a dataset to build an order.
- No order button just "continue" too ambiguous, "continue" should be an "OK" button.
- Consistency between map, temporal save, OK/continue, and cancel needed.

General Comments:

- Not having to scroll down was extremely helpful (to submit a search).
- Java technology plus non-linear panel layout extremely useful for interface.
- With broad parameter groups, hard to know which one to choose.
- Need to set consistent context of Netscape and applications, button names: Back = back "page" (netscape) OR Back = back "action stop" (application).
- consistency of knowing "when" to save
- Response/verification of actions (e.g., after "save" in temporal window.)
- Are there data descriptions (or plans) available on-line.
- Persistence for results 1, 2, and 3, for each search.
- Persistence for paging back and forth with select button on results screen.

- Continue and Order button combination not intuitive on results screen (vs. OK for example.)
- Zoom aspect ratio of rubber band is fixed.

B4 Notes on the UMCP Dynamic Query Tool:

The interface developed by the University of Maryland investigates the use of two new concepts for constructing queries. The first concept is that of the "Query Preview," the ability to narrow the query and view the anticipated results by geographic area, parameter, and time, prior to submitting the query to the ECS database. The second is the "Starfield." The Starfield allows the user to view the data collections by size, temporal range, and processing level.

Please explore these concepts and give us your feedback.

Task 1

Examine the relationship between the map tool at the top half of the window and the data listings shown on the bottom half of the window. Try selecting a geographic region and various attributes. How are the data displayed?

- What do the numbers mean? Can I define my own region? I don't like it.
- Not clear what the bars represent and why they're changing. (bars representing the number of datasets containing that parameter or year)
- Not sure initially what the relationships were between the map and listings
- User not sure what the relationship is between the attributes selection block, the map area, and the temporal area. Explain it to him, then he understood and liked it.
- Not clear what the numbers are (actually data sets)
- Positive response to initial screen (Query preview)
- This is a good feature which allows the user to pick data intuitively. Good for people who don't know what data exists and what doesn't.
- How do reset selections for attributes?
- Select N/A at 336 collections, but bars sum under attributes > 336. Deselect ICE year member but sum in map >268 for the whole globe? Same problem with year bar and map select two parameters is AND or OR function?
- Likes the visual feedback.
- Help user see relationships and explore available resources.

Task 2

After you have examined the interface and relationships between the map and data listings, construct a query for data using the criteria of your choice. Submit your query.

- Not clear whether the information is using an AND or OR.
- User didn't like getting the refusal message [over 500 hits]
- Need a way to select/deselect all
- User tried to create a query larger than 500 hits but was not able to, therefore did not get the error message.

Task 3

Examine the information provided in the Query Refinement window. Select datasets within the Starfield. Explore the relationships between the Starfield and the map and the Starfield and the Dataset ID table.

- The user went straight to the Starfield
- Realized that color referred to processing level. Liked the link between processing level and the starfield.
- Takes time to figure out relationships between various graphs, pictures, and tables.
- Likes being able to select processing level.
- Not always sure whether selections results in an OR or AND of selections
- Cannot do multiple select platform selection (as well as the others).
- Does display the relationship between a large number of parameters at once.
- User didn't know what is meant by "starfield."
- the tirekicker didn't know to turn "on" and "off" selected information by clicking on things once, then twice.
-User favorably inclined to the Starfield.
- Very positive reaction to the Query Refinement screen.
- Felt that this interface led the user - an intuitive way to search for data from general to specific.
- Vertical axis on Starfield not too useful - what happens if two datasets are of the exact same size - overwriting one another.
- Processing levels not too useful to most initial users.
- Doesn't think that "select first N" granules is a useful feature. Why are the first 10 or 20 or 30... special?
- User found the fake datasets confusing.
- When bar was highlighted, the dataset on list highlighted but other valids in other fields weren't highlighted.
- Starfield has no label.
- Can't use the geographic display to flag appropriate starfield items.
- If select from starfield will it pop up corresponding collections in a scroll field.

- Internet with starfield does not change information inside row of fields. (archive, session, platform, project).
- If you highlight collection ID, does not flag item in starfield but does in Geographical display.
- Update disconnections - sometimes the connections are not consistent.

Task 4

Examine the relationship between the Starfield and the Data Archive, Sensor, Platform and Project Selection tables.

- Liked the starfield refinement
- Will need a powerful client to do this as implemented.
- The data Archives Center - that stuff should be an OR
- To de-select things you need to have to do it in the reverse order! This was surprising.
- Want a "clear all" button or reset button.
- Tirekicker liked the implementation of dependent valids amongst the various selection tables.

- Some of the relationships between tables seemed confusing.
- Helps explore and discovery of relationships

Task 5

Select the NDVI dataset from the Dataset ID table to see an example of “Details on Demand.”.

- Selected data center and sensor and got nothing.
- Selected only Data Center and got browse image.
- User selected area on geographic display and expected an update in metadata e.g., number of hits, but it didn't update.
- Didn't know you needed to select data line on the starfield before you select "details on demand."

Task 6

To view an example of implementation of a browse image follow these steps:

1) In the Query Preview screen select North America

2) Select Normalized Difference Vegetation Index

3) Select 1987

4) In the Query Refinement screen reduce the number of hits by selecting AVHRR.

5) Go to the Starfield and select the NDVI dataset which is represented by a long, red line in the middle of the Starfield. This will highlight the NDVI dataset line. Details on demand are available from this point.

- The Browse image number should be more prominent.
- Select from geographic area does not update starfield

General Comments:

- Great concepts!
- the challenge is to translate these concepts into a real working system.
  - Scalability: with large amounts of data, attributes, etc. in the system
  - Ease of downloading the preview data and how current this preview data can be
  - Scalability for user's home machine - how hardware resource intensive is this for large systems with large amounts of preview data.
- would be nice to be able to choose different types of map projections (a query refinement panel) based on geographic area features - e.g., if it is a polar region.

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Appendix C. Survey Data

C1 ESST Survey Questions and Scores

0 The layout of the Earth Science Search Tool is clear and understandable.
1 Accessing the Attribute Selection Tool from the ESST window was easy.
2 It was easy to modify the toolbars to customize the ESST.
3 Being able to customize the Attribute Toolbar is an important capability.
4 Icons within the Attribute Selection Tool should be organized alphabetically.
5 Icons within the Attribute Selection Tool should be organized according to user preferences.
6 It was obvious how to access the Attribute Selection Tool.
7 It was easy to construct a data query using the ESST.
8 Adding search criteria to the Discrete Attribute Summary was easy.
9 Deleting search criteria from the Discrete Attribute Summary was easy.
10 It was easy to select search criteria from the attribute icon pull down menus.
11 I like the way invalid search criteria are "grayed out" and unselectable.
12 I like the way "Dependent valids" are implemented.
13 It was easy to select geographic coordinates using the map tool.
14 I like the way the timeline is implemented.
15 I would like to be able to enter geographic coordinates by typing them in to the tool.
16 I would like to be able to enter time-ranges by typing in the start and end dates.
17 I like the layout of the ESST Search Window.
18 The spatial and temporal summaries were useful as currently implemented.
19 The spatial and temporal summaries were confusing as currently implemented.
20 The spatial and temporal dialogs should be integrated with the summary screen.
21 The capability to submit multiple searches before the first set of results is returned (a.k.a., asynchronous searching) as implemented in PW2 is useful.
22 The capability to submit multiple searches before the first set of results is returned (a.k.a., asynchronous searching) as implemented in PW2 is confusing.
23 A multiple search submission (a.k.a., asynchronous searching) capability is important.
24 The Results window layout is clear and easy to understand.
25 Granules with associated browse images were clearly identified.
26 It was easy to select a browse image.
27 The Results window displays appropriate attributes.
28 The Results window should display attributes relating more to ordering data.
29 I like the linkage between the ESST and EOSView for viewing browse images.
30 Panning and zooming on images in EOSView was easy.
31 The ability to select different color palettes for the image display was useful.
32 The EOSView animation capability was useful.
33 The speed of the EOSView animation was appropriate.
34 The EOSView window layouts are easy to understand.

35 The EOSView HDF file window displays the file's structure clearly.
36 The functionality (display of data values, animation, zooming, etc.) provided in EOSView is adequate for my needs/uses.
37 Help information/instructions provided for EOSView are understandable.
38 Overall, I found EOSView easy to use.
39 It was easy to select a data collection for ordering.
40 It was easy to select a granule for ordering.
41 The metadata displayed on the Results List was appropriate.
42 The layout of the Results List was clear and understandable.
43 It was easy to complete the order form.
44 The order form layout was clear and understandable.

ESST Survey Responses																																									
	Question																																									
Tirekicker #		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
ecsGuest1	4	4	5	5	2	4	4	4	4	3	5	5	5	4		5	5	5	4	2	5	5		5	4			3	4											5	5	4	4		
ecsGuest2	4	4	5	4	3	4	4	4	4	4	4	5	4	4	4	5	5	4	4	2	4	4	3		4	4	3	4	4	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3
ecsGuest3	4	5	5	5	3	4	4	3	4	4	4	4	4	4	3	5	5	4	4	2	4	4	1	5	4	3	3	4	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Scale = 1 (strongly disagree) - 5 (strongly agree), 3 = no opinion/neutral, 0 = did not answer question.																																											
Count of 0s															1								1	1		1	1			1	1	1	1	1	1	1	1	1	1					1	1
Count of 1s																							1																						
Count of 2s					1															3									1															
Count of 3s					2			1		1					1								1			1	2	1		2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2
Count of 4s	3	2		1		3	3	2	3	2	2	1	2	3	1			2	3		2	2			3	1		2	2													1	2		
Count of 5s		1	3	2							1	2	1			3	3	1			1	1		2															1	1				

C2 V0 IMS WWW Survey Questions and Scores

0 The helpful hints provided a suitable level of detail.
1 The browser test form was useful.
2 It was easy to select geographic coordinates using the map tool.
3 Although there was no zoom capability within the map tool, I was able to select the appropriate geographic coordinates.
4 I like the way the type-in geographic coordinates is implemented.
5 I prefer graphical selection to type-in selection of spatial ranges.
6 The process of selecting discrete attributes was clear and easy to understand.
7 The implementation of dependent valid values was useful.
8 The DEFN feature was useful.
9 The guide feature was implemented in a useful fashion.
10 The existing attribute set was sufficient.
11 I would like to be able to add more attributes.
12 I was happy with the user interface performance over the web.
13 The communication status information was informative.
14 I like the way the status information was displayed.
15 The search "Stop" button is an important capability to provide.
16 (If you made a mistake in search specification) The error screen was informative.
17 I was able to use the error screen to determine the nature of my mistake.
18 It was easy to sort data results.
19 I like having the capability to sort search results.
20 The Results window layout is clear and easy to understand.
21 Granules with associated browse images were clearly identified.
22 It was easy to select a browse image.
23 It was obvious that a granule had to be selected and put in the "shopping cart" to be ordered.
24 I found the paradigm of a "shopping cart" confusing.
25 I found the "shopping cart" paradigm to be useful.
26 The instructional messages provided were informative.
27 Package-selection was faster when I used the "*" symbol.
28 Use of the "*" symbol was confusing.
29 The "Choose Package" screen was clear and understandable.
30 I am confident that I could follow up on any data that wasn't delivered.
31 The shipping manifest was clear and understandable.

V0 WWW IMS Survey Responses

Question																														
Tirekicker #		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ecsGuest1	3	2	4	4	3	3	4	4	2	3	4	2	4	3	4	5	4	4	4	4	4	3	3		1	5	2	3	3	4	4	4
ecsGuest2	3	4	2	2	4	3	4	4	3	4	4	4	1	4	3	5	2	2	4	4	2	3	3	3	4	4	3	3	3	4	3	2
ecsGuest3	5	3	2	2	5	5	5	3	5	4	4	2	4	5	5	5	4	3	3	5	4	5	2	1	4	2	3	3	4	3	2	5
ecsGuest4	4	3	2	2	5	4	4	4	4	5	4	5	2	4	3	5	5	5	5	5	4	4	4	5	1	5	4	4	3		4	4
Scale = 1 (strongly disagree) - 5 (strongly agree), 3 = no opinion/neutral, 0 = did not answer question.																																
Count of 0s																								1						1		
Count of 1s													1											1	2							
Count of 2s		1	3	3					1			2	1				1	1			1		1			1	1				1	1
Count of 3s	2	2			1	2		1	1	1				1	2			1	1			2	2	1			2	3	3	1	1	
Count of 4s	1	1	1	1	1	1	3	3	1	2	4	1	2	2	1		2	1	2	2	3	1	1		2	1	1	1	1	2	2	2
Count of 5s	1				2	1	1		1	1		1		1	1	4	1	1	1	2		1		1		2						1

C3 Java Earth Search Tool (JEST) Survey Questions and Scores

0 It was easy to select attributes for a search.
1 I like the implementation of icons and checkboxes to construct an attribute set.
2 I like the ability to create and save custom attribute sets.
3 It was easy to select available parameters using check boxes.
4 Use of icons to access available parameters was obvious.
5 It was easy to select available parameters using checkboxes.
6 The search summary information was clear and understandable.
7 Display of the summary screen was an important feature.
8 It was easy to submit a search.
9 I like the way the map tool is implemented.
10 It was easy to select a geographic area using the map.
11 Zooming in and out on the map was easy.
12 It was obvious how to zoom in on the map.
13 It is important that the cursor location (long/lat) be displayed on the map tool.
14 Saving spatial coordinates to the search summary was easy.
15 I like the layout of the map tool.
16 The layout of the search results was clear and easy to read.
17 The attribute information displayed was appropriate.
18 It was easy to select and modify the attributes in a previously saved search.
19 Modification of the available attributes in a previously saved search is a capability I would use frequently.
20 It was obvious how to select a previously saved search.
21 I like the layout of the Temporal Selection Tool.
22 The timeline feature of the Temporal Selection Tool was easy to use.
23 Color-coding datasets according to their DAAC site is an important feature.
24 I would like to be able to customize the color-coding of the datasets so they can represent other information (instrument, platform, etc.).
25 It was easy to select a time range using the tool bar.
26 I like having the capability to type in as well as use the mouse to select search start and end dates.
27 It was easy to select a collection to order.

Jest Earth Search Tool (JEST) Survey Responses																											
	Question																										
Tirekicker #		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
ecsGuest 1	5	5	5	4	4	4	4	4	5	5	5				5	5	4	4	4		2	4	4	5	4	4	5	3
ecsGuest 2	4	4	4	5	2	4	4	4	4	4	4	2	1	2	4	4	4	4	4	5	4	5	4	3	3	4	5	4
ecsGuest 3	4	4	5	5	2	4	5	4	5	2	2	2	1	5	4	2	2	3	5	5	4	2	4	2	5	3	5	5
ecsGuest 4	4	4	5	2	4	2	3	4	5	4	4	2	2	5	4	4	4	3	4	4	4	4	4	5	5	5	5	4
ecsGuest 5	4	4	5	2	4	2	3	4	5	4	4	2	2	5	4	4	4	3	4	4	4	4	4	5	5	5	5	4
ecsGuest 6	5	4	4	3	3	3	4	4	3	4	4	2	2	5	3	3	4	3	4	4	3	5	5	3	4	5	4	3
ecsGuest 7	2	2	4	3	4	3	3	5	5	1	1	1	1	5	3	1	3	3	2	5	4	4	2	5	3	1	5	4
ecsGuest 8	5	4	5	5	4	5	4	5	5	2	2	2	1	4	5	3	3	3	5	4	5	4	4	2	4	3	5	5
ecsGuest 9	5	4	5	5	4	4	5	5	5	3	3		2	5	5	4	4	4	4	5	4	5	5	4	4	5	5	4
Scale = 1 (strongly disagree) - 5 (strongly agree), 3 = no opinion/neutral, 0 = did not answer question.																											
Count of 0s												2	1	1						1								
Count of 1s									1	1	1	4			1											1		
Count of 2s	1	1		2	2	2			2	2	6	4	1		1	1		1		1	1	1	2				
Count of 3s				2	1	2	3		1	1	1				2	2	2	6			1			2	2	2		2
Count of 4s	4	7	3	1	6	4	4	6	1	4	4			1	4	4	6	3	6	4	6	5	6	1	4	2	1	5
Count of 5s	4	1	6	4		1	2	3	7	1	1			6	3	1			2	4	1	3	2	4	3	4	8	2

C4 UMCP Dynamic Query Interface Survey Questions and Scores

0 I like the way data collections are represented on the map tool.
1 It is easy to select geographic regions of interest.
2 Being able to preview the anticipated query results prior to submitting my query is an important capability.
3 I like the Query Preview paradigm.
4 The Query Preview paradigm is clear and understandable.
5 An interface using the Query Preview paradigm should be developed by ECS.
6 The function of the Query Preview Bar was obvious.
7 Users should be able to submit queries that anticipate more than 500 hits.
8 I like the way the time selection tool was implemented.
9 It was easy to select a parameter of interest.
10 It was easy to construct a query using the tool.
11 The toggling function of the individual items in the lists of attributes is obvious.
12 Defining a search containing fewer than 500 hits was easy.
13 The information I received after submitting my query was what I expected.
14 The layout of the Query Preview window was clear and easy to understand.- I like the linkage between the Starfield and the map.
15 Selection of a geographic area from the map should affect the collections/data sets displayed in the Starfield.
16 Linkage between the Starfield and the Dataset ID table is an important capability.
17 The information displayed in the Starfield was clear and easy to understand.
18 Use of color to display different data processing levels within the Starfield was effective.
19 The Starfield is a good tool for displaying information about datasets.
20 Information contained in the Dataset ID table was appropriate.
21 A zoom feature on the Starfield would be a useful capability.
22 It was easy to select data using the Archive, Sensor, Platform and Project selection tables.
23 The information displayed in the Starfield was clear and easy to understand.
24 The Starfield is a good tool for displaying information about datasets.
25 The layout of the Query Refinement window was clear and easy to understand.
26 The purpose of the "Details on Demand" button was clear.
27 I expected a browse image to appear after selecting the "Details on Demand" button.
28 I like the way the access to browse imagery is implemented.
29 Information provided with the browse image was appropriate.

UMCP Dynamic Query Prototype Survey Responses

Tirekicker #	Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
ecsGuest1	2	2	4	4	3	4	3	3	2	3	2	4	4	2	3	4	4	2	3	3	4	4	2	2	2	2	2	1	2	4
ecsGuest2	4	4	4	5	4	5	3	5	4	4	4	4	5	4	4	5	4	4	4	4	4	3	4	4	4	4	4	4	4	4
ecsGuest3	4	5	5	5	4	5	4	5	4	4	4	3	3	4	4	4	5	4	5	5	4	5	4	4	5	4	3	3	4	4
ecsGuest4	2	3	4	3	2		1	5	2	4	3	2	3	3	4	5	4	4												
ecsGuest5																														
ecsGuest6	5	5	5	5	5	4	4	5	4	4	4	4	4	4	4	4	5	3	4	4		4	4	4	4	4	4	2	4	4
ecsGuest7	4	5	3	2	2	3	5	5	5	4	4	5	5	1	5	5	5	2	3	2	2	2	4	2	2	3	4	2	4	4
ecsGuest8	4	4	5	4	4	5	4	2	4	4	4	4	4	3	4	5	5	4	4	4	4	5	3	4	4	4	2	2	2	2
ecsGuest9	3	5	5	5	4	4	2	4	2	4	4	4	3	4	4	5	4	3	4	3	2	4	4	3	4	2	4	4	2	4
Scale = 1 (strongly disagree) - 5 (strongly agree), 3 = no opinion/neutral, 0 = did not answer question.																														
Count of 0s	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	2	2	2	2	2	2	2	2	2
Count of 1s							1							1														1		
Count of 2s	2	1		1	2		1	1	3		1	1		1				2		1	2	1	1	2	2	2	2	3	3	1
Count of 3s	1	1	1	1	1	1	2	1		1	1	1	3	2	1			2	2	2		1	1	1		1	1	1		
Count of 4s	4	2	3	2	4	3	3	1	4	7	6	5	3	4	6	3	4	4	4	3	4	3	5	4	4	4	4	2	4	6
Count of 5s	1	4	4	4	1	3	1	5	1			1	2		1	5	4		1	1		2			1					

C5 Coincidence Search and Subsetting Mockups Survey Questions and Scores

0 The PW2 web walk-throughs were useful.
1 PW mock-ups help provide a view into the ECS Client design.
2 The modified EP6 Sugarland Run scenario was easy to follow.
3 The use of frames with these web scenarios was helpful.
4 The use of frames with these web scenarios was confusing.
5 The frame implementation of the index was a useful feature.
6 The frame implementation of the index should be considered for use in ECS Client tools.
7 The Coincident Search tool is useful ONLY under the Results window.
8 The Coincident Search tool is useful under the Results window and the Main ESST window.
9 The Coincident Search tool window is easy to follow..
10 The parallel design(i.e., reuse) of the ESST Main Search Tool is a good idea.
11 New attribute selection is easy to follow.
12 Showing the spatial and temporal summaries as text is appropriate.
13 There should be an option to show the spatial and temporal summaries graphically.
14 The spatial and temporal summaries should be consistent with the ESST.
15 The update of the Coincident results to the Results Window is useful versus a separate window.
16 The use of panes within the Results Window is useful.
17 The Coincident Search spatial and temporal restrictions make sense for ECS.
18 The original search specifications should be available for selection in the Coincident Search Tool.
19 The representation of the Subsetting Service data availability by collection is well understood.
20 It is obvious that the Subsetting Service could be selected by granules within a collection as well as by collection.
21 The Subsetting window functionality is readily apparent.
22 The presentation of the spatial, temporal and parameter summaries per collection is appropriate.
23 The granule listing, with updated valids selections based on the subsetted regions is useful.
24 The granule listing, with updated valids selections based on the subsetted regions is confusing.
25 The potential use of key parameters for Subsetting is an appropriate service.
26 The potential use of key parameters was conveyed well enough.
27 The use of the granule coverage codes for the spatial tool is useful.
28 The use of the Temporal tool to view granule time is appropriate.
29 The Results screen update is logical for this Collection level service.
30 The granule summary 'Xs' based on valids is a useful demarcation.
31 The "S" service, as explained in the 5.1 step, is a potentially useful device.

Coincidence Search and Subsetting Mockups Survey Responses																															
	Question																														
Tirekicker #		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ecsGuest1																															
ecsGuest2																															
ecsGuest3	4	4	4	4	2	4	4	4	4	4	4	4	4	2	4	4	4	4	3	4	4	4	4	4	2	4	4	4	4	4	4	4
ecsGuest4	3	4	4	4	2	3	3	4	3	4	4	4	2	5	3	4	4	1	5	4	4	4	4	4	2	5	4	3	5	5	4	4
ecsGuest5	5	4	5	5	1	5	5	2	5	4	4	4	5	3	3	4	4	5	5	3	3	4	4	5	1	2	2	4	5	4	4	5
ecsGuest6	4	4	4	4	2	3	2	2	4	4	4	4	4	5	5	4	4	3	4	4	3	4	4	4	2	4	4	3	4	4	4	4
ecsGuest7	5	5	4	4	1	3	4	3	3	4	5	5	4	4	3	4	4	5	5	2	3	2	4	4	2	4	1	3	3	3	4	4
ecsGuest8	4	4	2	2	2	5	5	2	4	2	4	4	2	4	4	4	4	2	4	1	2	2	1	2	3	5	2	1	2	2	4	2
ecsGuest9	4	4	4	4	2	4	3	2	4	4	4	4	4	5	4	3	4	4	4	4	4	4	4	4	2	4	3	4	4	4		4
ecsGuest10	4	5	4	4	2	3	3	2	4	4	4	4	5	4	5	5	4	4	4	4	3	4	4	5	1	4	3	4	5	4	5	5
Scale = 1 (strongly disagree) - 5 (strongly agree), 3 = no opinion/ neutral, 0 = did not answer question.																															
Count of 0s	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2
Count of 1s					2													1		1			1		2		1	1				
Count of 2s			1	1	6		1	5		1			2	1				1		1	1	2		1	5	1	2		1	1		1
Count of 3s	1					4	3	1	2					1	3	1		1	1	1	4				1		2	3	1	1		
Count of 4s	5	6	6	6		2	2	2	5	7	7	7	4	3	3	6	8	3	4	5	3	6	7	5		5	3	4	3	5	6	5
Count of 5s	2	2	1	1		2	2		1		1	1	2	3	2	1		2	3					2		2			3	1	1	2

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Appendix D. Attendees

Scientist/Tirekicker

Manuel Penaloza (SDSM)
Paul Hertz (GMU)
Mike Caruso (WHOI)
Dave Emmitt (U Va)
Dan Baldwin (U Co)
Nigel Hinds (SDSM)
Nazmi El Saleous (GSFC)
Ruixin Yang (GMU)
Hank Wolf (GMU)
Menas Kafatos (GMU)

DAAC

Jim Connor (ASF)
John Dwyer (EDC)
Dan Ziskin (GSFC)
David Myrick (LaRC)
Chris McNeave (NSIDC)

ESDIS

Yonsook Enloe
Bob Harberts
Ken McDonald
Robin Pfister
Marti Szczur
Dawn Lowe
Chris Rouff

ECS

Keith Bryant
Jan Poston Day
Ed Dombrowski
Scott Diamond
Troy Blackwell
Lynne Case
Kevin Limperos
Charlie Poole

Doronel Basappa
Show Chen
Tim Guebbells
Andy Fullford
Mike Daily